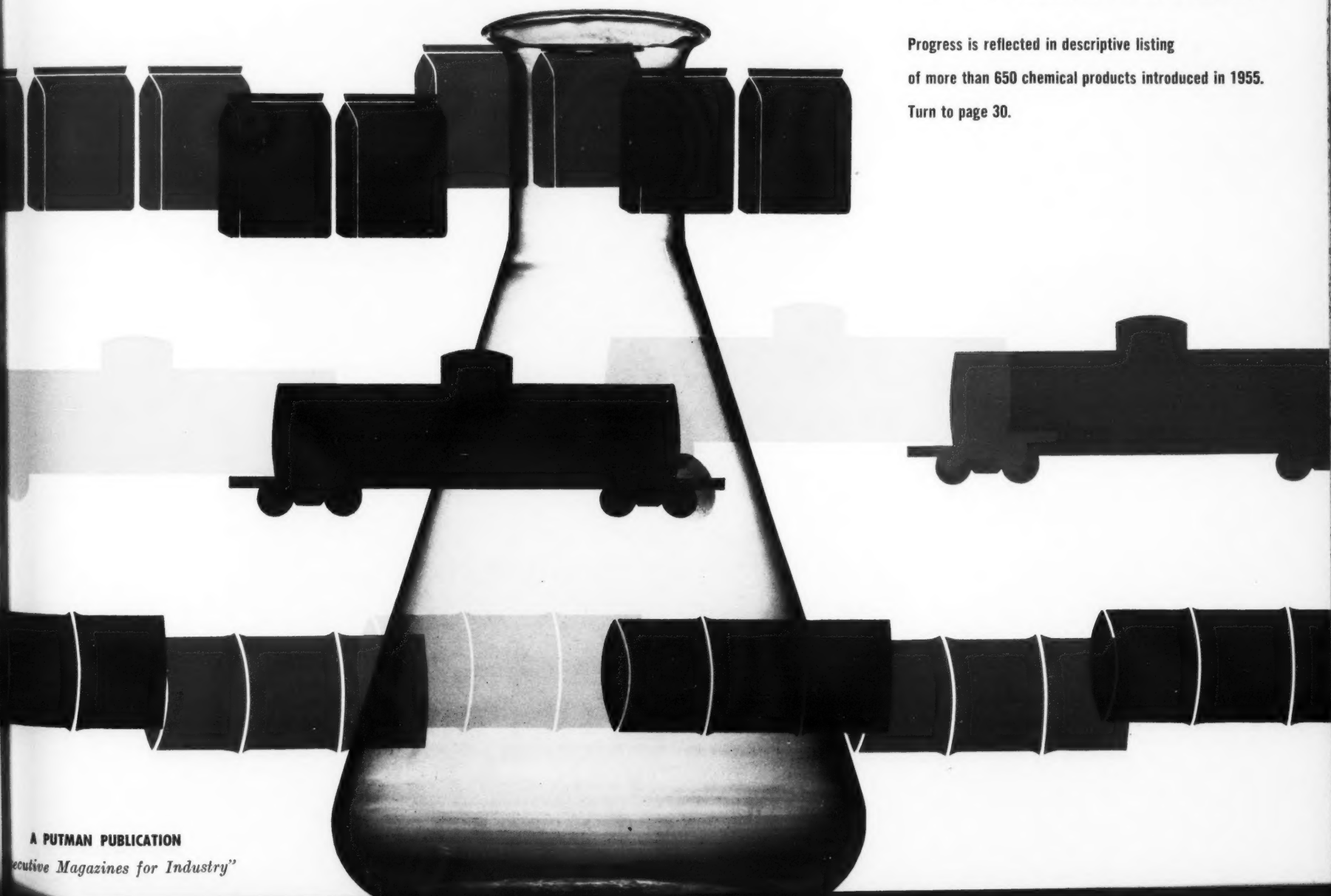


# chemical processing

*For Men who Manage*

## SYMBOLS OF PROGRESS IN CHEMICAL MATERIALS

Progress is reflected in descriptive listing  
of more than 650 chemical products introduced in 1955.  
Turn to page 30.



A PUTMAN PUBLICATION

*Executive Magazines for Industry*

# BAKER & ADAMSON'S



## ...UNIVERSAL CATALYST?

VERSATILE Boron Trifluoride has rung the bell as a catalyst so many times... has "carried through" so many different organic syntheses... that some chemical engineers are beginning to think of BF<sub>3</sub> as almost universal in its applications.

THE NEXT synthesis problem it will help solve may well be yours. Write today for more detailed information on the properties and some of the uses of Baker & Adamson Boron Trifluoride and its complexes.

For  
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Alkylation  
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And Many Other  
Reactions



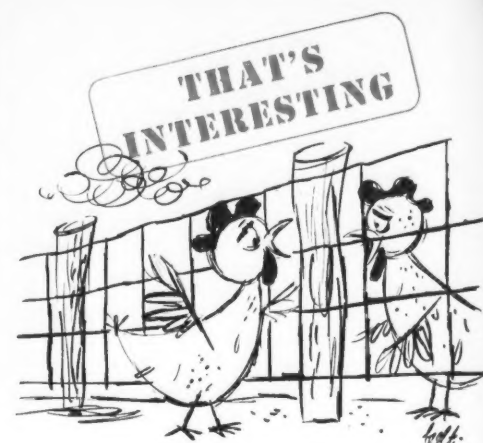
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Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_ CP-4



When inquiring check CP 4580 opposite last page



That's what happens when some scientist starts finding new applications for home permanent kits!

Home permanents for chickens?  
It could feather your nest

An economical insulator made of a surplus farm product, for sleeping bags, life jackets, and cold-weather clothing, may substitute for expensive, imported waterfowl feathers and down currently brought in from eastern Europe and Asia. Aim is to substitute chicken feathers and thereby provide a profitable outlet for an annual surplus of about 200,000,000 pounds.

Secret to giving chicken feathers permanent curl and bulking qualities (comparable to goose down and water-fowl feathers) is in reacting the keratin in the feathers with glyoxal. Permanent waving also imparts water repellency, resiliency, and springiness in addition to eliminating odor which occurs at high humidities. (*Chemical Progress*, Carbide and Carbon Chemicals)

Aerosol invades TV

An aerosol anti-glare spray that's water-soluble so it can be wiped off reflective objects like band instruments, plastics and jewelry after use promises TV cameramen quick relief from troublesome highlights that often result from the strong lighting required on television stage sets.

Dispensed at the push of a button, the product is non-flammable... in fact, it acts as a fire extinguisher when sprayed on burning paper.

DuPont's Freon is the propellant for this anti-glare spray which is made by Crescent Portrait & Frame Co., 14069 Euclid Ave., East Cleveland 12, Ohio.

Molecules made to order

Prefabricated "polysoaps" promise to shed light on solubilization, wherein normally insoluble oils become soluble. An example is the solubilization of fats in the blood stream by certain protein molecules. Polysoaps, like protein molecules, differ from the more familiar high polymers in that they remain very compact in solution.

Polysoap molecules are detergent molecules joined chemically to eliminate the possibility of change in numbers or structure. They can be prefabricated to desired sizes.

(Please turn to page 235)



# chemical processing

(CHEMICAL PROCESSING PREVIEW)

*for men who manage*

Vol. 19 April, 1956 No. 4

Serving more than 45,000 circulation in these industries:

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BPA



Photo courtesy Bettis Rubber Company, Whittier, California

## A case of joint enterprise!



RUBBER &  
RUBBER CHEMICALS  
DEPARTMENT

Uncontrolled, a string of many joints of drill pipe is surprisingly flexible — rubs and slams against the casing — causes undue wear and damage.

As protectors, drillers first collared the pipe with spacers of natural rubber. These did an excellent job in face of extreme abuse and abrasion.

But the advent of oil-based drilling muds brought a new problem: the natural rubber quickly swelled and deteriorated.

To meet the need for high tensile strength plus resistance to the abrasion and attack of the drilling fluids, an enterprising specialty molding company worked jointly with all concerned to perfect a new compound based on CHEMIGUM — the easy processing nitrile rubber.

The extreme oil resistance of CHEMIGUM made possible a truly "all purpose" protector which not only wears well and retains its position on the pipe, but does so at higher temperatures than any other on the market.

How can the ease of processing, outstanding oil resistance and excellent physical properties of CHEMIGUM improve your product? For details, write:

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When inquiring check CP 4581 opposite last page



### 665 chemical developments designed to help you

In the rush to tally up all the financial gains of our industry during 1955, there might be a tendency to overlook one important entry on the black side of the ledger, because it may not have contributed highly to profits. This entry? New chemical developments.

Yet, do these materials deserve such cursory treatment? Some of these new products may be the source of much of the income on the profit-and-loss statement ten to twenty years from now. Then too, some may falter along the way — if demand is found insufficient.

Of 665 new chemical materials described in this year's survey, 254 are offered for the first time *anywhere*. How many of these developments will make the grade? Only the test of time will tell.

Turn to page 32 where we have indexed every item by its suggested uses. See if there aren't some of these developments that will help you.

*Frank E. McElroy*

ASSISTANT EDITOR

- For more information on articles and advertisements in this issue, check the Reader Service slip opp. last page
- The product directory, pages 225 to 228, is your guide to all articles and advertisements
- To subscribe to this magazine, see reader-qualification form opp. last page

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### THIS MONTH'S COVER

Lab flasks, drums, bags — even tank-cars. These symbolically portray the cornucopia of chemical products available to us. Last year, many more items were introduced. You can learn about them in this month's Chemical Materials section that starts on page 30.



Apr 9-12. 25th National Packaging Exposition, The American Management Association, Convention Hall, Atlantic City.

Apr 9-11. American Pharmaceutical Manufacturers Association, Annual Meeting, Boca Raton Club, Boca Raton, Florida.

Apr 10-11. Symposium for Management on Industrial Applications of Analog Computers, Midwest Research Institute, Hotel Phillips, Kansas City, Missouri.

Apr 10-12. Twelfth Annual Meeting and 1956 Metal Powder Show, Metal Powder Association, Hotel Cleveland, Cleveland.

Apr 10-12. Council for Agricultural and Chemurgic Research, Annual Conference, Congress Hotel, Chicago.

Apr 18-20. National Industrial Research Conference, Armour Research Foundation of Illinois Institute of Technology, Illinois Tech Campus, Chicago.

Apr 21-27. 1956 Industrial Health Conference, Convention Hall, Philadelphia.

Apr 22-25. American Oil Chemists' Society, Annual Meeting, Shamrock Hotel, Houston, Texas.

Apr 23-28. Chemical Progress Week, sponsored by Manufacturing Chemists' Association.

Apr 25. Association of Consulting Chemists and Chemical Engineers, Banquet and Symposium, Belmont Plaza Hotel, New York City.

Apr 26-27. American Institute of Electrical Engineers, Instruments & Measurement Committee, Conference on Recording and Controlling Instruments, Bradford Hotel, Boston.

Apr 27. Society of Chemical Industry, Chemical Industry Medal Presentation, Waldorf-Astoria Hotel, New York City.

May 6-9. The American Institute of Chemical Engineers, Roosevelt Hotel, New Orleans.

May 9-11. American Institute of Chemists, Annual Meeting, Statler Hotel, Boston.

May 9-11. Welding Show, American Welding Society, Memorial Auditorium, Buffalo.

May 14-15. Chemical Market Research Association, Biltmore Hotel, New York City.

May 20-22. Chemical Specialties Manufacturers Assn., Mid-year Meeting, Drake Hotel, Chicago.

May 27-June 2. American Society for Testing Materials, Fourth Conference on Mass Spectrometry, Netherlands Plaza Hotel, Cincinnati.

June 5-8. The Material Handling Institute, Inc., All-industry Exposition, Cleveland Public Auditorium, Cleveland.

June 11-15. Seventh National Plastics Exposition, The Society of the Plastics Industry, Inc., Coliseum, New York City.

## what's new in electric fork trucks?

# BAKER "FT"



Here's welcome news for the material handling field—an *all new* line of battery-powered fork trucks engineered to *today's standards* to *meet today's needs*—the first such contribution made by a major manufacturer in over a decade!

The new Baker "FT" now combines in one machine all the latest improvements in truck engineering and design to produce an electric truck that is easier and safer to operate, more dependable in performance. It has less "overhang", less "dead weight", greater stability, shorter turning radius, more forward tilt and lower silhouette.

Make sure you know all these new features before you buy your next electric fork truck. Write for complete information.

**Baker**

handling equipment

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Subsidiary of Otis Elevator Company

When inquiring check CP 4582 opposite last page

6E2



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Heat exchangers for the process industries from Alberger... heating and power boilers and plate fabrication from Farrar & Trefts... packed and packless expansion joints, pipeline accessories and water and oil heaters and coolers from American District Steam... steel and alloy plate and pipe fabrication, structural work, and heat exchangers from California Steel Products on the West Coast.

That's the line-up at ADSCO now!

Where else can a buyer find such a diversified array of equipment that is vital to the heating, chemical, oil, gas, food, pharmaceutical, mechanical, power and atomic energy industries?

The ability of one company to be integrated and yet so diversified is bound to work for the benefit of its customers. Better engineering... broader manufacturing facilities... greater efficiency... faster deliveries... greater teamwork... increased purchasing power of materials at lower cost... standard designs of equipment that others custom-make... and an East-West operation with great differentials in freight rates.

The list of advantages is indeed long. Call upon ADSCO and see first hand what impressive things this new, closely-knit, comprehensive firm is doing.

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Boiler-Burner Units • Heating and Power Boilers  
Steel and Alloy Heavy Plate Construction • Pressure Vessels



## THE OPPORTUNITY IS YOURS!

★ ★ ★ ★

**GENERAL J. E. HULL, U.S.A., Ret.**  
President, Manufacturing Chemists' Association

The observance of Chemical Progress Week, scheduled this year from April 23rd to the 28th, offers an unusual opportunity to everyone associated with the chemical industry. Here is our chance to tell our friends and our neighbors what our industry is and what its products mean to the life of the nation.

To be specific, our goals are fourfold:

1. To let everybody know the extent and function of the chemical industry.
2. To let them know the things the chemical industry makes, or makes possible, for them.
3. To show them how important our industry is to them and to the nation.
4. To show them how chemical progress flourishes in a favorable climate.

These objectives are the same as those for the two previous Chemical Progress Week celebrations but now that we have a background in this activity, we are in a position to do a better job than ever before.

If each of the 825,000 men and women who make up the chemical industry assumes an individual responsibility for making CPW-1956 a success, the results can be almost incalculable.

The challenge is an imposing one. Too many people are still unaware of what the chemical industry is and what it makes. So no matter what your capacity is as a worker in the chemical industry you can do your part to dispel this lack of knowledge about our industry. All of us can be its good-will ambassadors and pitch in together to tell the nation our story.

We have much of which to be proud. Not so long ago the President's Materials Policy Commission stated that "the greatest scientific and educational activities over the last two or three decades have dealt with matters of chemistry."

For the 1956 observance, our forces have been marshaled earlier than ever before. The number of persons already enlisted for the CPW job is at a new high and at least six states which have not par-



★ ★ ★ ★

General Hull, former United States and United Nations Commander-in-Chief in the Far East, retired from the army on April 30, 1955, after 38 years of service. He was appointed MCA president on August 1, 1955. He has served as member of the executive committee of the Research Board for National Security (1945), organizer and first director of Weapons System Evaluation Group, Department of Defense (1949-1951), army deputy chief of staff for administration (1951), and vice-chairman of the Defense Committee to study problem of American prisoners of war captured in Korea (1955). In 1948, he commanded and conducted atomic weapon tests for the AEC at Eniwetok Atoll.

General Hull's many United States and foreign decorations and awards, include the U.S. Distinguished Service Medal with Three Oak Leaf Clusters, the Silver Star, the Legion of Merit, Honorary Commander Order of British Empire, and French Commander of the Legion of Honor. He holds honorary degrees of Doctor of Military Science from Pennsylvania Military College, and of Doctor of Laws from Miami Univ. (O.)

★ ★ ★ ★

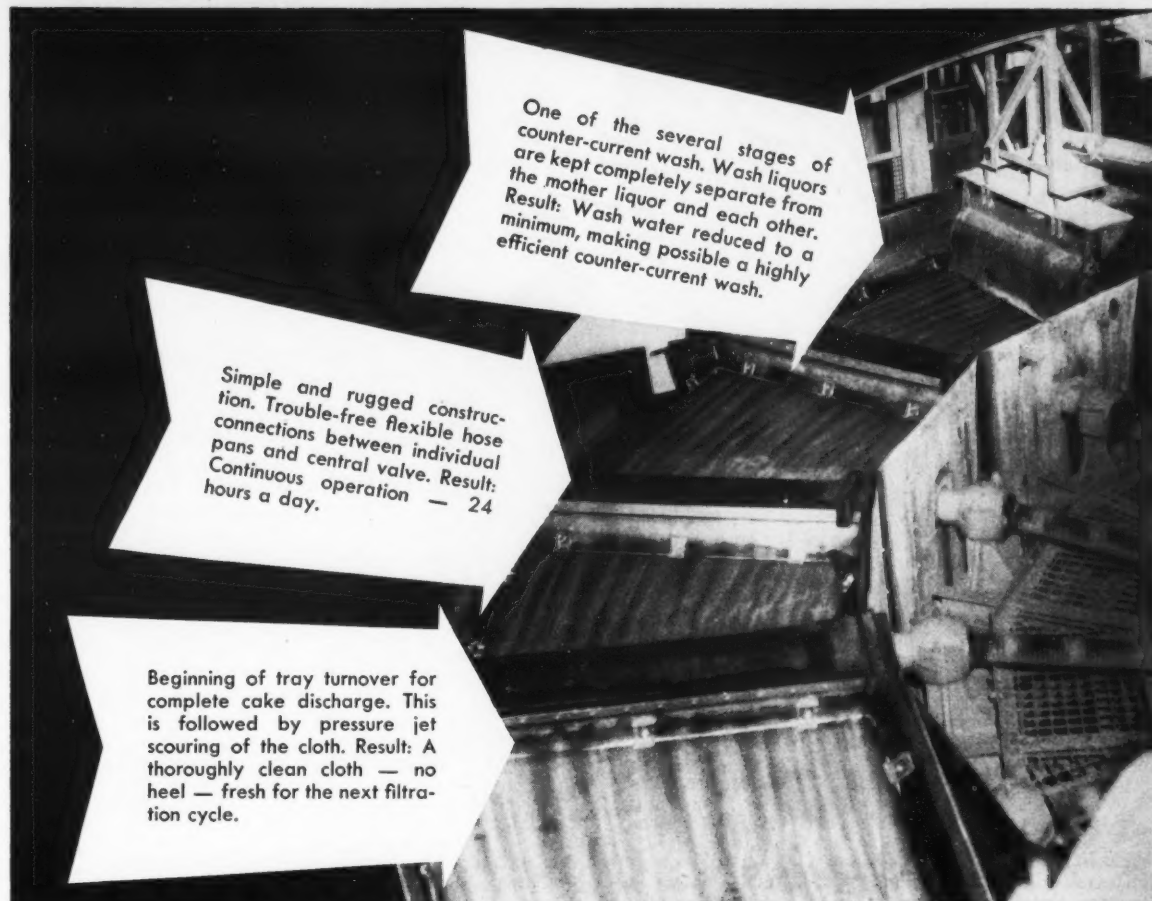
anticipated previously are being organized for action. The materials designed for use in this third celebration are more numerous and more appealing than those available heretofore. All in all, early indications augur well for an impressive impact upon American thought.

Among the new materials which I have reviewed is a long needed career guidance booklet, "Frontiersman of the Future", which should be an invaluable aid for CPW workers — not only to CPW workers in carrying their message to the schools and colleges but also to everyone identified with the industry in carrying on our educational program. We are faced with the urgent need of doing an increasing part in stimulating more interest among students in following science careers; also a larger role in helping those institutions in every way to do a steadily better job. MCA's education program is now unfolding and it will call for the cooperation of the entire industry in this common endeavor.

At this point, let me urge those who have already staged CPW programs to review past experiences in their areas. New and worth-while activities certainly should be considered, but at the same time, a study of preceding efforts may be productive of even better results.

I would like to take this opportunity to point out to the readers of CHEMICAL PROCESSING that every company which considers itself a part of the chemical industry is welcome to join with us in "Chemical Progress Week."

(Editor's Note: For details on "Chemical Progress Week" contact Manufacturing Chemists' Association, 1625 Eye Street, Northwest, Washington, D.C.)



One of the several stages of counter-current wash. Wash liquors are kept completely separate from the mother liquor and each other. Result: Wash water reduced to a minimum, making possible a highly efficient counter-current wash.

Simple and rugged construction. Trouble-free flexible hose connections between individual pans and central valve. Result: Continuous operation — 24 hours a day.

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When inquiring check CP 4585 opposite last page

what you can expect in  
next month's issue...

### Mechanical memory

By usual standards, packaging operations at G. D. Searle & Company's Skokie, Ill., plant operated fairly well. Production averages were satisfactory, but daily output fluctuated. Annoying feature of the situation: detective work for maintenance men.

Packaging Supervisor Bill Grigg changed this picture by installing an operations recorder. Every line shutdown was noted by this mechanical memory. More important, apparent causes of shutdown were noted on a log sheet. Payoff: maintenance time has been more profitably used and efficiency of the operation has increased several per cent. Associate Editor Bruce Fader visited the plant, wrote the story appearing in May.

### Granular carbon for decolorizing can be regenerated

Next month's CHEMICAL PROCESSING introduces you to a decolorizer for cane sugar liquors that's so effective it permits filtering cycles of 20 to 30 days before regeneration. When regenerated, type CAL carbon returns to its original efficiency and density, cycle after cycle, and at reasonable cost. Its "burn ratio" is 0.7. This means that only 0.7 lb have to be reactivated for every 100 lb of melt.

Assistant Editor Frank McElroy visited John Cooper, General Manager of Pittsburgh Coke & Chemical's Activated Carbon Division. Resulting story will be found in May's Materials Section.

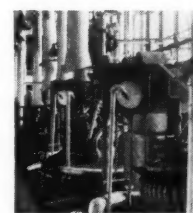
### One man operates drying system — handles 60 tons per hour

When the Marquette Cement Company bought its Rockmart, Ga., plant a couple of years ago, engineers immediately went to work looking for ways to boost production. First thing they tackled was method of drying and sizing limestone. Here are the

results: new Fluosolids system, handling up to 60 tph continuously and automatically, has more than doubled previous capacity.

In operation since March, 1955, system enables one man per shift to operate entire feed preparation plant. Other important savings — equipment requires only 1/8 the floor space needed by the old equipment, and fuel consumption has been cut in half.

Assistant Editor Ted Meinhold stopped over at Rockmart, took the pictures, and then wrote the story that appears in May CHEMICAL PROCESSING's New Solutions section.



### Air curtain protects men and equipment

G. D. Searle's Chemical Manufacturing Division has installed a local exhaust ventilation system. Setting up an air curtain around the vessel opening, system picks up fumes directly from reaction vessels — preventing any danger of inhalation by personnel, eliminating explosive gas mixtures, and protecting equipment from corrosive vapors.

Assistant Editor Bill Clarke visited Searle, talked to Chemical Engineer Carl Seveland, and tells how it's done in next month's Safety section.

### X-rays at Esso

To keep tabs on growing uses of X-ray techniques in lab work, next month's Laboratory section will carry a rundown of current practices. To gather data for this article, Associate Editor Bruce Fader visited the modern laboratories of Esso Research in Linden, N. J. Here X-ray photometers, diffraction and fluorescence equipment are in wide use.

Here's a quick preview  
of features you'll find  
in May **CHEMICAL PROCESSING**

Esso's use of the equipment ranges from routine TEL analysis (X-rays save hours here) to difficult research work like finding make-up and causes of engine deposits (X-ray is the only practical method). For your "tour" through the Esso Labs, be sure to see the May issue.



#### A billion ice cubes daily for neoprene plant

A refrigeration system equivalent to 288,000 household refrigerators operating continuously — enough to produce a billion ice cubes daily — is used at DuPont's neoprene plant in Louisville, Ky. A May New Solutions story tells how compact centrifugal compressors are used with Freon in the system. Associate Editor Gordon Weyermuller, who made the trip to Louisville and photographed the operation, is shown taking notes as Power Superintendent A. L. Frankhouser (left) and George Pearce, of DuPont's Kinetic Chemicals Division (right) discuss the operation.

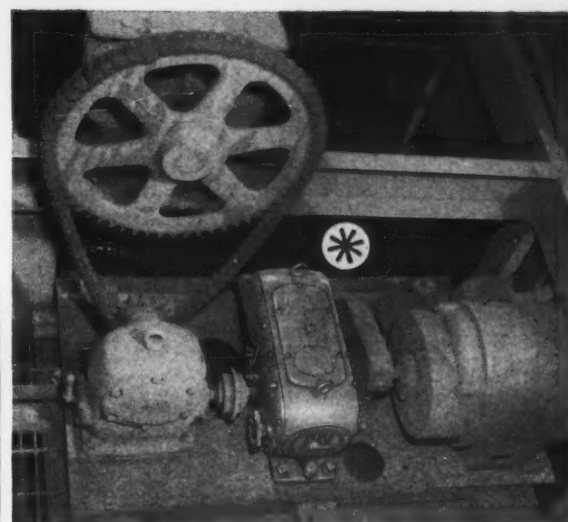
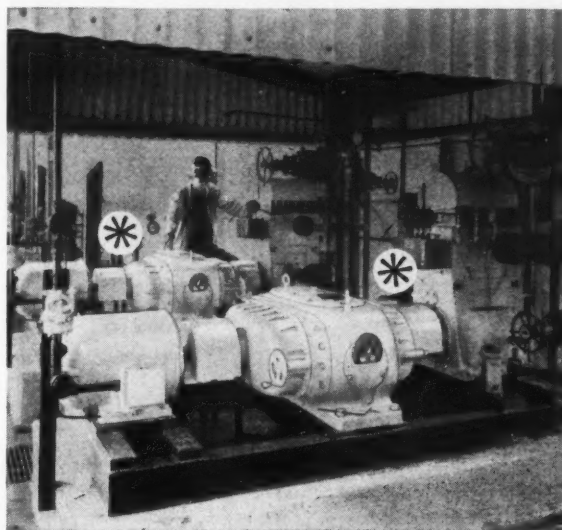
#### And in July ...

the Corrosion Control section will be highlighted. Material will include the latest developments in "the corrosion battle," "Corrosion Key" data charts, case histories of corrosion problems, condensations of technical papers, and a Guest Editorial by an outstanding authority in the corrosion field.

This year Mr. F. L. LaQue, Vice President and Manager, Development and Research Division, The International Nickel Company, Inc., will be the Guest Editor. We think that what Mr. LaQue has to say about the role of management in controlling corrosion will be of high reader interest.

## Carbon black...

By means of a hand wheel on this Link-Belt P.I.V. Variable Speed Drive, speed of the driven screw conveyor can be changed at will to feed carbon black into pelletizing conveyor at optimum rate.



## ...to carbonyl

P.I.V. drives are particularly adaptable to delicate or sensitive manufacturing processes that require exacting variable speed transmission, like these high-pressure pumps circulating nickel carbonyl.

## IT'S P.I.V. for exact regulation at an infinite number of variable speeds

### *Delivers required hp from maximum to minimum settings*

**S**elect your speed... set it... get it. Whether it's maximum or minimum, under full or light load, Link-Belt P.I.V. gives you positive, stepless changing — infinitely selective, effortless, precise.

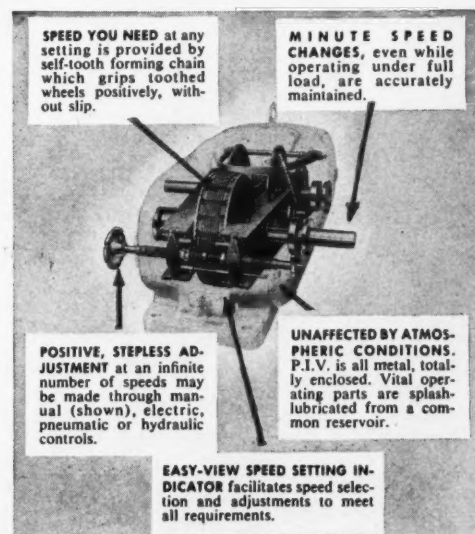
There's no dependence on friction here. Instead, self-tooth-forming chain meshes with

grooved wheels, delivering required speeds constantly, dependably.

Versatile P.I.V. drives are made in 8 sizes, 16 types, from ½ to 25 hp. Let your nearest Link-Belt office or authorized stock-carrying distributor know your needs or send for 88-page Data Book 2274.

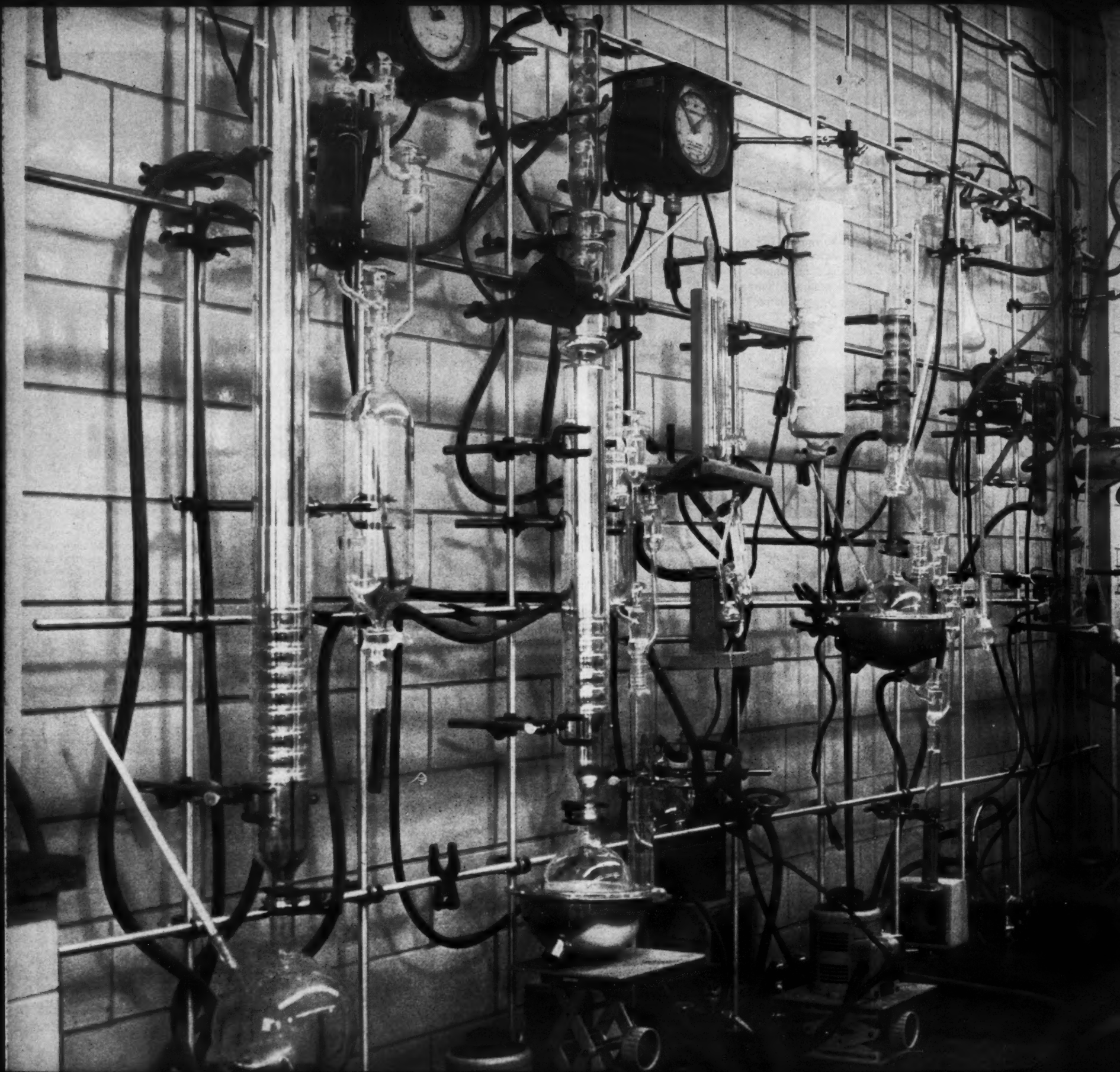


**LINK-BELT COMPANY:** Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 13,977



When inquiring check CP 4586 opposite last page

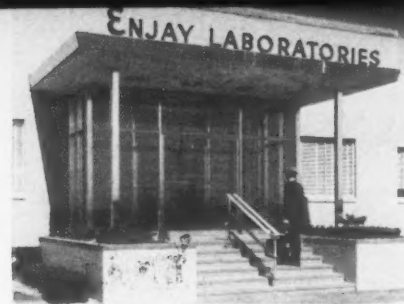






**new solutions  
of processing problems**

**Color problem in the manufacture of  
plasticizer is solved,  
while corrosion is eliminated  
and maintenance lowered as —**



## *Enjay technical service assists Company X*

**GORDON WEYERMULLER**, Associate Editor  
With **ERVING ARUNDALE**, Assistant Director  
and **JOHN P. THORN**, Group Leader  
Enjay Laboratories, Linden, N. J.

**Problem:** Company X — a vinyl converter making vinyl film and sheeting — ran into difficulty with highly colored esters in the manufacture of DIOP (diisooctyl phthalate) plasticizer. Company had been buying this material on the outside. In early 1954 decision was made to manufacture the plasticizer in the plant in order to lower costs. Accordingly, esterification equipment was installed.

Some of this material could be used in company's own plastics which were colored. However, plasticizer was also sold on general market where color was critical. In addition to problem of prod-

uct quality, plant equipment corroded rapidly, making excessive maintenance necessary.

Company had a consultant review process but still had trouble. Technical men at the company also reviewed the process themselves and did laboratory work, as well as try to change plant operations in order to correct the difficulties. However, the problem persisted.

**Solution:** Enjay was contacted in August 1954. A technical service representative visited Company X and studied the process. Company X was cooperative in making complete information available. Samples were obtained of the chemicals being used in the process — isooctyl alcohol, phthalic anhydride, chlorinated hydrocarbon entrainer, and paratoluene sulfonic acid catalyst.

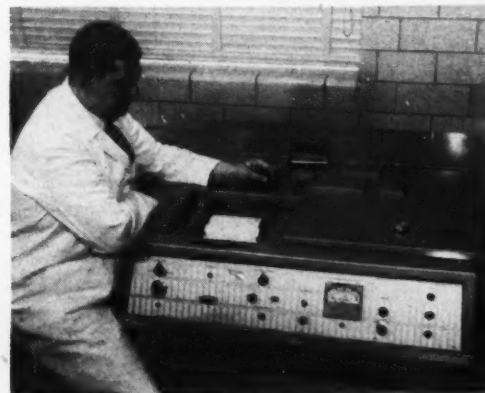
In the second step Company X laboratory representatives visited Enjay Laboratories and spent a day there. At this time an esterification was run with the samples of raw materials being used. Fact was substantiated that the color of the prod-

*(Please turn to page 18)*

◀ Much of research work on problem of Company X was done on equipment of this type



Preparing to measure the electrical resistance of a sheet of vinyl film



Analytical instruments such as this infrared spectrophotometer are available at Enjay



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◀ C

APRIL

**Radial connector system at Eli Lilly  
eliminates complicated valve arrangements,  
streamlines operations, and provides . . .**

## ***greater piping flexibility***

**All processing lines converge at  
centrally-located "switchboard"**

**TED F. MEINHOLD**, Assistant Editor

Data verified by **RALPH TRUAX**, Process Engineer  
Eli Lilly and Company

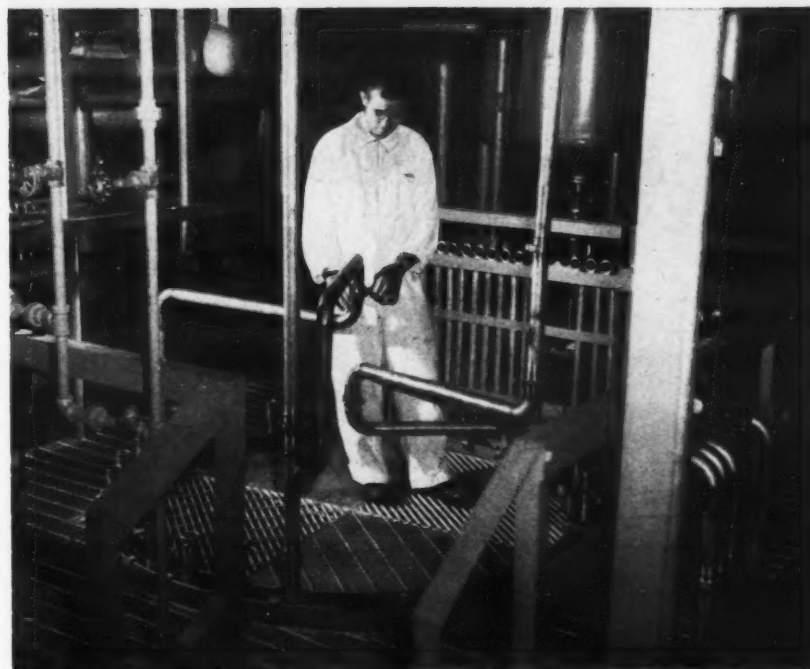
**PROBLEM:** When Eli Lilly and Company was designing its new Tippecanoe Laboratories at Lafayette, Indiana, engineers were looking for ways to keep the process pipelines as simple as possible. They wanted to avoid a "Christmas tree" type of system. This was especially true in the antibiotics purification building. Lines and equipment located here had to be flexible, capable of performing various operations and handling many different products. Pipe had to be arranged so that changeovers could be quickly and easily made.

Sanitation was equally important. Dead spots in process lines had to be kept to a minimum to prevent accumulation of stagnant material and contamination to other products. Fittings and lines had to be corrosion-resistant, easy to clean, and capable of withstanding frequent steam sterilization.

**Solution:** Engineers designed a "switchboard" piping layout which incorporated stainless steel tube and a radial connector system. All processing lines in the building converge on a centrally-located 8' x 8' steel platform where they are attached to one of two 5'-diam steel rings. Each ring has 32 open-end, 2"-OD 316-stainless-steel headers fastened to it. One ring is mounted directly on the floor of the platform; the other is approximately 8' above the first.

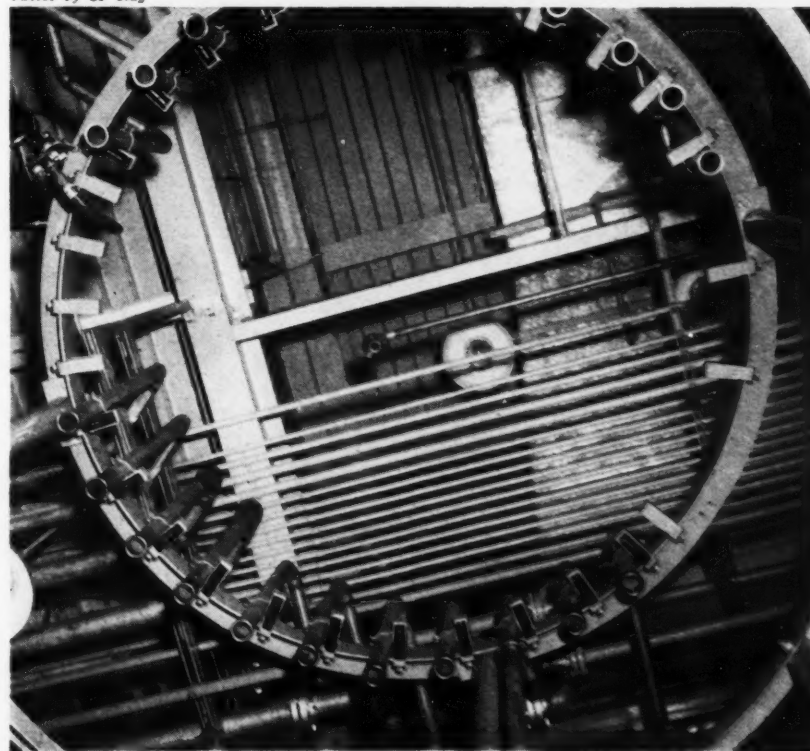
Special prefabricated lengths of tube, equipped with stainless Tri-Clamp "snap-action" connectors, are used to connect any two, three, or four headers together — regardless of what ring they are on. All headers are labeled for easy identification. Connectors eliminate complicated valve setup. Valves are located only on the equipment end itself, for shut-off purposes. Remainder of pipe is joined with special sanitary fittings.

*(Please turn to page 20)*



Prefabricated lengths of tube are used to bridge gap between individual headers

*Photos by CP Staff*



Radial connector system has headers attached to two 5'-diameter steel rings. Photo shows upper ring. Lower ring is located on floor of platform

◀ Connections are made easily and quickly with  
"snap-action" fittings



**new solutions  
of processing problems**

An aqueous liquid with only 56-60% solids usually cannot be burned directly . . . but — Consolidated Water Power & Paper Company produces steam by . . .

***burning water-containing liquor***  
**(only 57% solids)**  
***without auxiliary fuel***  
**in existing boiler furnaces**

**WILLIAM C. CLARKE**, Assistant Editor  
Verified by **H. P. BALDWIN**, Vice President  
Consolidated Water Power & Paper Company  
Wisconsin Rapids, Wisconsin

**Problem:** Every week a pulp mill of Consolidated Water Power & Paper Company at Appleton, Wisconsin, must burn 1200 tons of water-containing by-product . . . consisting of only 57% solids. Potential heat value is about 4400 Btu/lb of liquor, compared with 13,000 Btu/lb of coal. This material, spent sulfite liquor, is a by-product of sulfite process used by Consolidated in manufacture of Mitscherlich pulp.

**Solution:** Existing boiler furnaces were adapted to burn watery material *without* auxiliary fuel to sustain combustion. Two furnaces handle 1200 tons per week at rate of 9-10 gpm/furnace.

Trick in burning concentrated sulfite liquor is to maintain a high furnace temperature and feed concentrate with required quantities of combustion air. Sufficient turbulence is required to cause intimate air-fuel mixing.

Burning of concentrate cannot be handled in a modern furnace with cooled walls because furnace temperature would be too low. Consolidated installed pre-burners with non-cooled walls to maintain burning temperatures. Addition of pre-burners also allows drying of atomized liquid fuel.

Pre-burners are added to furnaces very much like "dutch" ovens. Fuel is fed into burner under 85 to 90 psi together with steam at 125 psi to atomize the liquor. Y-jet nozzles are used to inject the liquor.

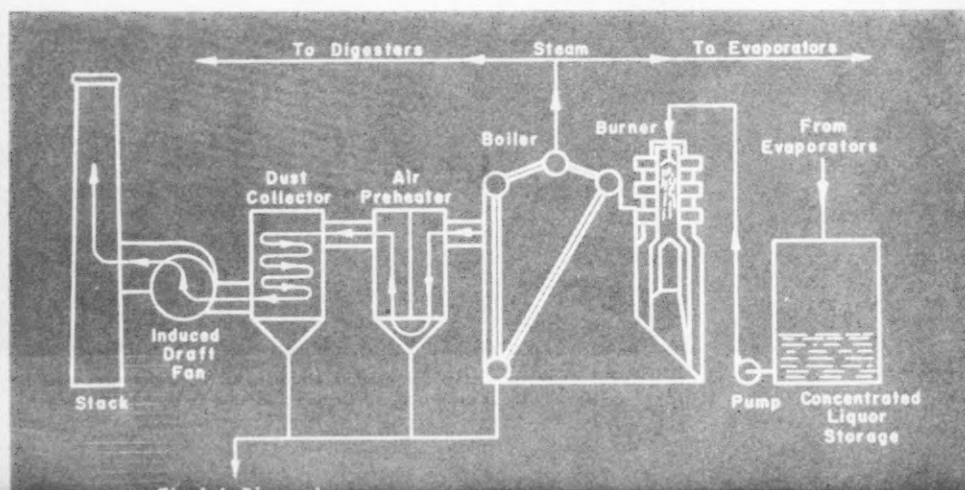
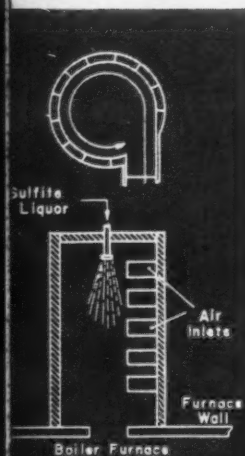
Pre-burners consist of cyclone-like vortex chambers. Combustion air is fed tangentially along length of cylindrical chamber so as to produce and maintain a

(Please turn to page 20)

Liquid fuel is injected into whirling air-stream. Walls of pre-burner are non-cooled refractory

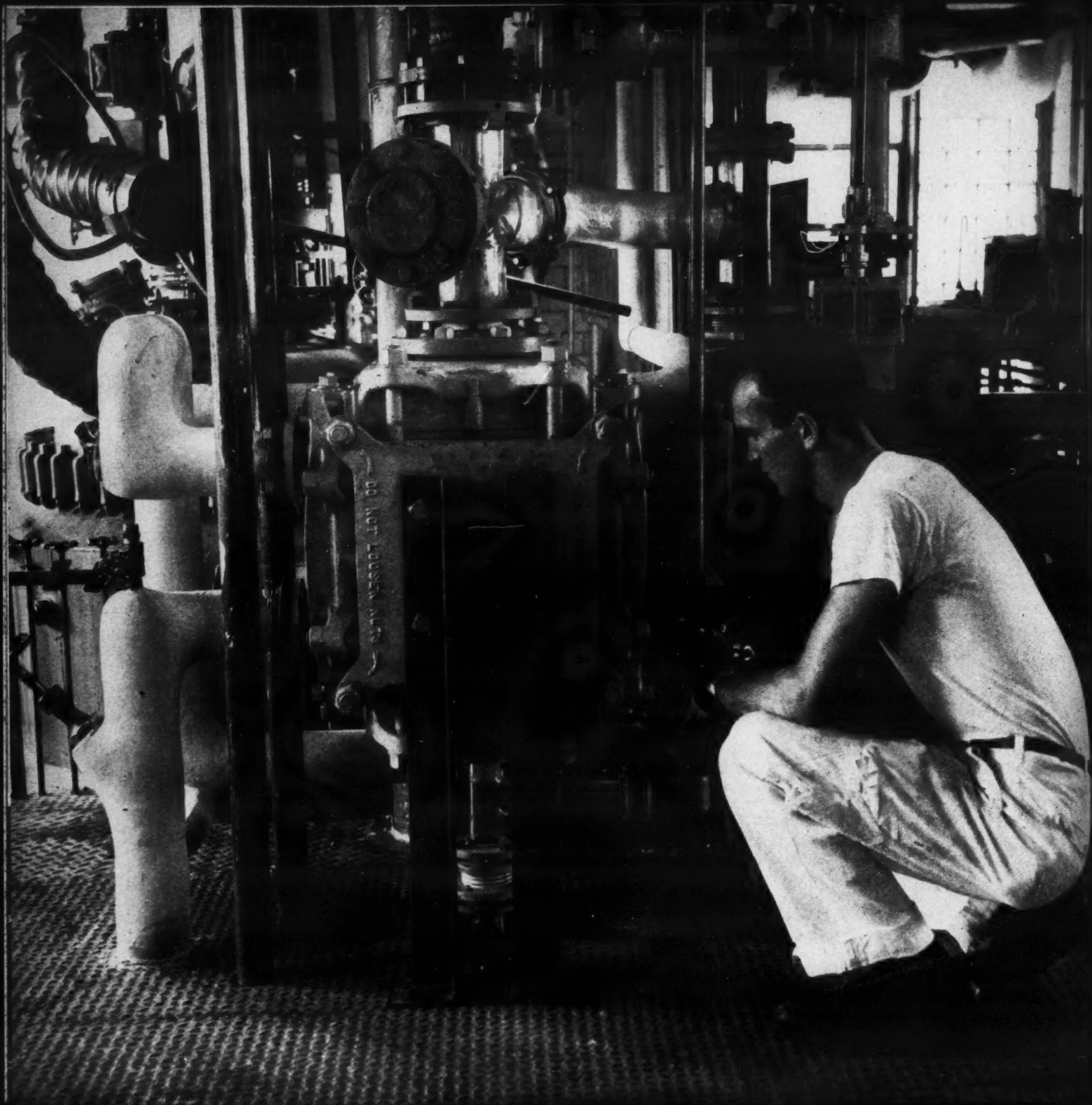
Consolidated's plant at Appleton, Wisconsin, produces steam by burning a sulfite by-product.

(Flow diagram below)  
CP Staff Photo











Cubical heat exchangers are "lifesavers" at Eli Lilly. Graphite units handle many different products and provide . . .

## *high heat transfer in small space*

**Units occupy only  $\frac{1}{8}$  the floor space of  
conventional exchangers having  
same surface**

**TED F. MEINHOLD**, Assistant Editor  
Verified by **DR. FREDERIC R. LLOYD**, Manager  
Chemical Mfg. Dept., Eli Lilly and Company

**PROBLEM:** With over 200 chemicals in production — and more on the way — engineers in the Chemical Manufacturing Department, Eli Lilly and Company, Indianapolis, Indiana, have to make the most out of the limited amount of floor space available to them. Processing equipment has to be flexible and arranged as efficiently as possible. Most operations are batch and units must be capable of handling many different materials.

One of the problems that used to be encountered involved condensers and heat exchangers. Not only was their application to different processes limited (due to heat transfer surface or corrosion resistance), but whenever process changes were made, the large, bulky units always presented a serious floor space problem.

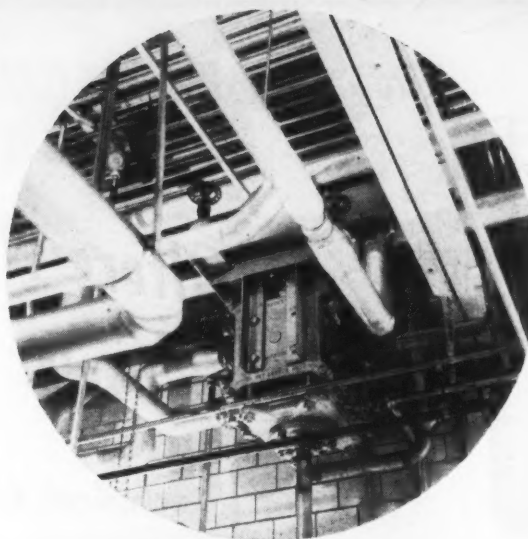
**Solution:** About  $2\frac{1}{2}$  years ago, department engineers started experimenting with cubical graphite heat exchangers. Extremely compact, a 15" cube provides 50 sq ft of effective heat transfer surface and requires only  $\frac{1}{8}$  the floor area necessary to house a conventional tube and shell exchanger with equal transfer surface.

The impervious graphite cube is housed in heavy cast iron headers. The resin-impregnated graphite is unaffected by almost all corrosives except a few highly oxidizing agents. Unit has high thermal conductivity (about 5 times that of cast iron) and is immune to effects of thermal shock.

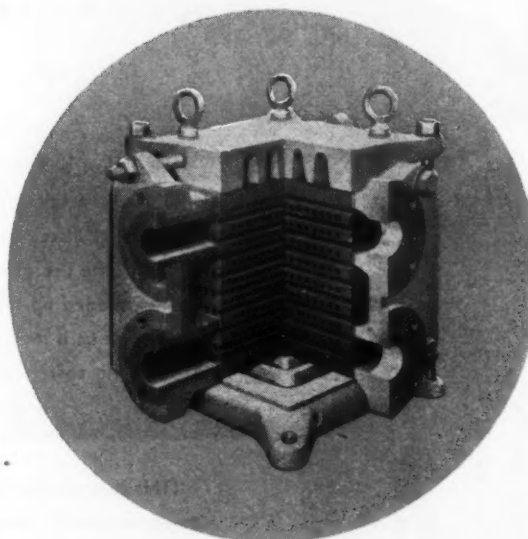
Two or more cubical exchangers can be hooked together to double the transfer surface. Exchangers operate at pressures up to 150

*(Please turn to next page)*

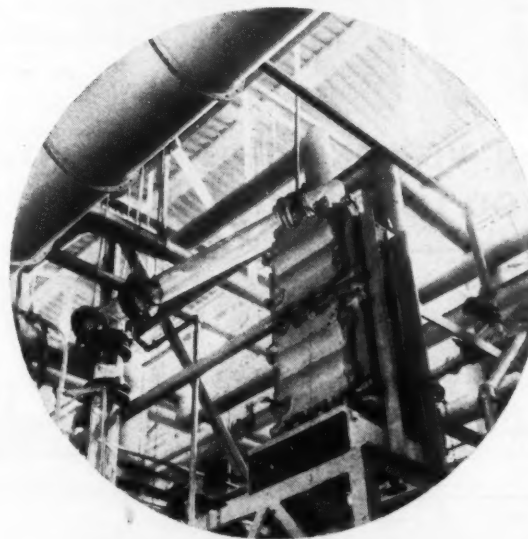
Eli Lilly engineers report that heat transfer coefficients as high as 200 Btu/hr/sq ft/°F have been observed  
*CP Staff Photo*



Compact cubical heat exchanger fits neatly into small space next to wall  
*CP Staff Photo*



The impervious graphite cube is housed in heavy cast iron headers



Exchangers can be hooked together to double the heat transfer surface  
*CP Staff Photo*



# VISKON

## Filters Will Lower Costs!

**Technical Director  
RAYMOND C. ADAMS  
Gilman Paint & Varnish Co.**

### Says...

"Just a note to advise you of the wonderful results we have obtained with your VISKON discs . . . We have been able to eliminate the use of a Filteraid and have also speeded up the filtering operation and, strange as it may seem, have actually lowered the cost of our filter media . . ."

\* \* \*

(This is a typical statement from many companies which have changed over to VISKON Filter Fabric to speed up flow rates, obtain clearer filtrates, and to lower per unit costs in operation.)

**Have YOU checked VISKON? THIS NONWOVEN FILTER FABRIC MAY HELP YOU LOWER YOUR FILTERING UNIT COST**

#### USE THIS HANDY COUPON OR

Dictate Your Inquiry Letter To:  
Mr. A. I. Pierce, Filter Media Engineer  
CHICOPEE MANUFACTURING CORPORATION  
P. O. Box 72 • North Little Rock, Arkansas

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_  
Type of Filter Press \_\_\_\_\_



# VISKON

**nonwoven fabrics**

When inquiring check CP 4587 opposite last page

#### NEW SOLUTIONS of processing problems

#### High Heat Transfer

(Continued from preceding page)

psi. Countercurrent flow is provided in all multi-pass units up to 16 passages. (Exchangers are currently being produced in 9" and 15" cube sizes. Special models can withstand operating temperatures up to 5700°F.)

**Results:** The department now has nine of the compact graphite exchangers — eight 100 sq ft units and one with 50 sq ft surface. Used primarily as condensers, the units have been "life-savers" as far as space savings are concerned. Maintenance-free, flexible and efficient, they handle hydrochloric acid, thionyl chloride, phosgene, chlorobenzene, ether, alcohols, and many other materials. Engineers report that heat transfer coefficients as high as 200 Btu/hr/sq/ft/°F have been observed.

(Impervite cubical heat exchangers, similar to those used above, are product of Falls Industries, Inc., Dept. CP, Aurora Road, Solon, Ohio . . . or for more information check CP 4588 on form opposite last page.)



#### Technical Service

(Continued from page 11)

uct was poor, about 200 Hazen, when made by the process. By cross-checking the ingredients with material known to be good, it was found that the quality of the raw materials was not the source of the difficulty.

Some literature studies were made on the chlorinated hydrocarbon entrainer. It was found that this chemical was not very stable under the conditions in which it was used. This instability resulted in the formation of hydrochloric acid. Rundown lines, condensers, and separators were corroding badly due to this HCl. It was found that toluene could be substituted satisfactorily for the chlorinated hydrocarbon without the harmful results of the latter.

Another important part of the solution was the use of a blanket of CO<sub>2</sub> during the esterification. This inert blanket excluded air and prevented degradation reactions due to oxidation.

Dry NaHCO<sub>3</sub> was being used to neutralize the catalyst. Aqueous NaOH was substituted, giving a more effective neutralization and helping to remove the color. Since no finishing technique had been employed, it was suggested that carbon black treating be used as a final "polishing" step.

Representatives of both companies discussed the experimental results. Effect of catalyst concentra-

(Please turn to page 19)



## why run a risk with *Question-Mark* fittings

Is the manufacturer a piping specialist?

Can he help us in engineering?

How about his experience and reputation?

Is his stock available nearby?

Does he have a complete line?

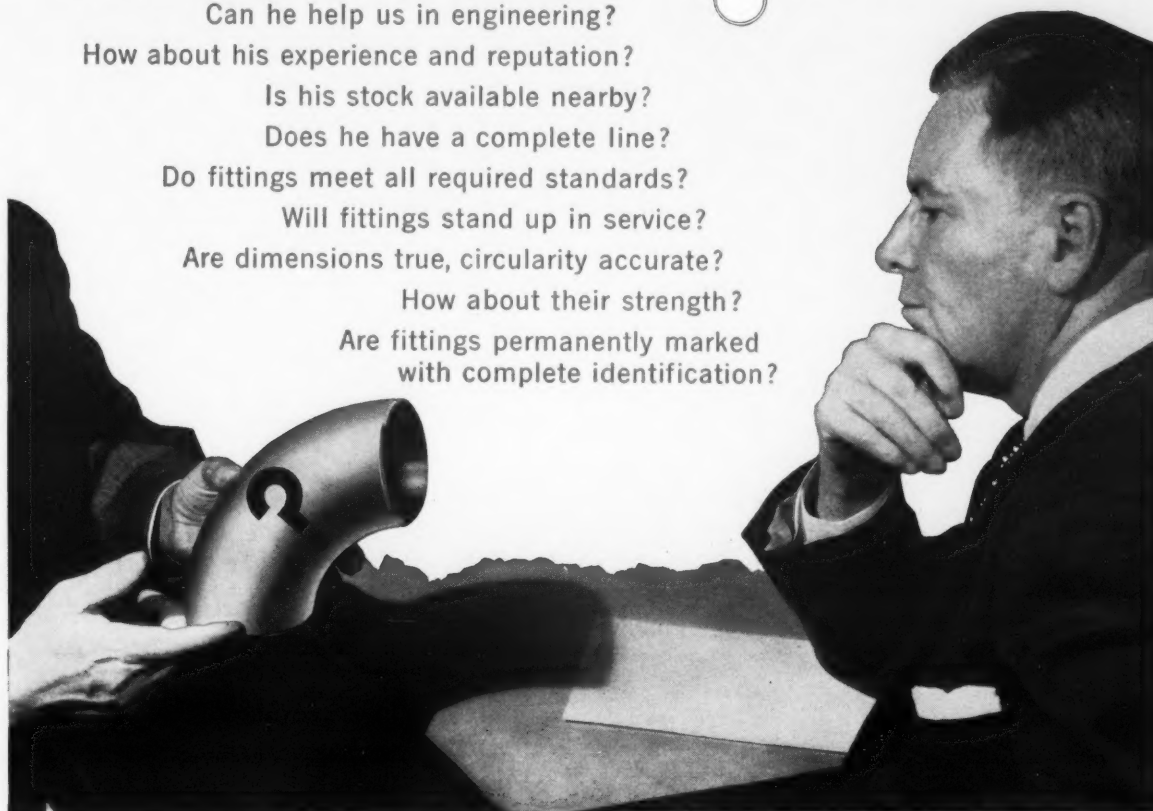
Do fittings meet all required standards?

Will fittings stand up in service?

Are dimensions true, circularity accurate?

How about their strength?

Are fittings permanently marked  
with complete identification?



## No unanswered question...no risk when you buy known fittings

**Y**OU SAVE purchasing time and avoid trouble later on when you buy TUBE-TURN\* Welding Fittings and Flanges. Made in U.S.A. by the leader in the field, these products give you top quality and uniformity, backed by unmatched engineering service and nearby complete-line distributor facilities.

They meet *all* American Standard and Safety Code requirements. Each product is permanently identified by the "TUBE-TURN" trademark with complete size and material designation. You can't get a better bargain in welding fittings and flanges than from your trusted Tube Turns' Distributor!

*The Leading Manufacturer of Welding Fittings and Flanges*

# TUBE TURNS

LOUISVILLE 1,  
KENTUCKY

A Division of National Cylinder Gas Company

DISTRICT OFFICES: New York • Philadelphia • Pittsburgh • Cleveland • Detroit • Chicago • Kansas City • Denver  
Los Angeles • San Francisco • Seattle • Atlanta • Tulsa • Houston • Dallas • Midland, Texas



"TUBE-TURN" and "TT"  
Reg. U.S. Pat. Off.

POSITIVE IDENTIFICATION

You **KNOW** your reputation is  
safeguarded when you specify  
"TUBE-TURN products"

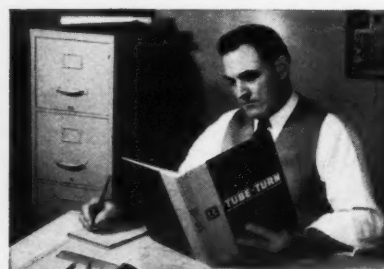


**THE WELDER KNOWS** he's getting the exact fitting specified on the blueprint because the fitting is clearly marked with all designations.

**Complete...Permanent Identification!**



**THE STOREROOM WORKER KNOWS** he is selecting the right fitting when it's marked "TUBE-TURN". The fitting bears complete information called for on the requisition.



**THE DESIGNER KNOWS** that his specifications will be carried out precisely where his drawings call for "TUBE-TURN products". At every stage ... from purchasing to pipe installation, people **KNOW** what they're getting and using.



**CLEARLY MARKED.** TUBE-TURN® Welding Fittings are completely identified as to dimensional and metallurgical facts. Here is your assurance that you have the **RIGHT** fitting, and that it has passed Tube Turns' rigid inspection and quality control.

This is just *one* reason why you should specify the leading brand of fittings and buy from your trusted Tube Turns' Distributor.

TUBE-TURN Welding Fittings and Flanges are made in U.S.A.  
They meet all U.S. piping code specifications.

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Reg. U.S. Pat. Off.

## Technical Service

(Continued from page 18)

tion was studied in order to arrive at an optimum rate of reaction. Process had to be fitted into plant's normal two-shift operation. A number of succeeding visits were made back and forth by representatives of Enjay and Company X.

Temporary changes were first made in plant. Near the end of 1955 plans were made to make all the recommended plant changes on a permanent basis.

**Results:** Color of the plasticizer has been lowered from 200 to 15-20, well within industry requirements. Corrosion of plant equipment has been stopped and maintenance costs decreased.

Efforts of Enjay were greatly appreciated by Company X. At present Enjay is furnishing the company isooctyl alcohol for use in the manufacture of the plasticizer. Close contact is being maintained with Company X in case further assistance is needed.

Enjay had done this type of work in cooperation with a number of other companies. As soon as something of value to a customer is found out in research laboratory, he is notified immediately so he can make any desired changes.

Latest in scientific equipment and instrumentation is available to the technical personnel at the new facilities of Enjay Laboratories completed in 1955 at Linden, N. J. If additional equipment or information is needed, Enjay engineers and chemists have access to other divisions of the Esso Research and Engineering Co., one of the largest research and engineering organizations in the world.

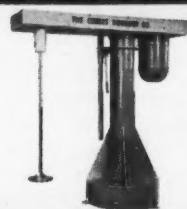
(Courtesy of Enjay Laboratories, Dept. CP, PO Box 51, Linden, New Jersey.)

# PLAN AHEAD

For more information on product at left, specify CP 4589 . . . see information request blank opposite last page.

## MANY MODELS TO CHOOSE FROM

—special engineering adaptations if necessary



10 and 20V with hydraulic lift. For big volume production. 80" high, 10-30 HP.



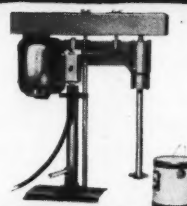
10 and 20D, for installation on your own tanks. For adaptation up to 40 HP.



20D—Tank Type. Standard models for capacities of 100, 250 and 500 gallons. Special engineering for specific needs.



7-VTV—Mobile Tip-Up Type. For 5 to 80 gallon batches. Width 4 1/4". Max. tilt will accommodate 46" tank.



1-VT Laboratory Lift-Up Type. For testing, pilot plants and small batches. Results identical to production-size models. Max. rise, 44".

# NEW improved models of COWLES DISSOLVERS

give you ultimate dispersion

2 to 20 times faster than ordinary

machines—in a fraction of the

space—at a fraction of the cost

*Let us prove it in your plant...at our risk!*

Here are typical examples from the complete new line of Cowles Dissolvers. They feature many improvements that make them better than ever before. If you are using bulky, slow, conventional equipment, the proper Cowles equipment for your needs will give you increased speed, greater volume and higher quality end products—plus savings in cost—that will amaze you.

We are so sure of its many advantages we want to demonstrate them to you—with the actual equipment, in your own plant, on your own products—without obligation to purchase.

Applicable to viscosities up to and in excess of 50,000 centipoises, they impart high velocity to material at a speed of 3600 to 6000 f.p.m. at the periphery of the impeller. Zones of intense turbulence are created, producing extreme shear and impact. After turbulence, flow becomes laminar, dividing at vessel wall to assure complete circulation of the entire batch. This action breaks down solids to ultimate dry particle size, exposes greatest possible area of reactants to each other, and surrounds each particle with a film of liquid.

The new models require less head room, include patented impellers for processing a wide variety of products, and many other refinements for ease of operation and maintenance. If milling is required following mixing, teaming up Cowles Dissolvers with Morehouse Mills will produce products of finest quality at rates that are nothing less than spectacular.

A trial will convince you that this equipment will give you greater production, of higher quality, at less cost—all over results that mean you can—

## Make More Profits with Morehouse-Cowles

You can make such a trial in your plant at our risk. Write today for complete details—

MOREHOUSE-COWLES, INC., 1150 San Fernando Rd., Los Angeles 65, Calif.  
Representatives in Principal Cities (Cable Address "MORESPEED," Los Angeles)

Quality Production Champions  
of the Processing Industries.

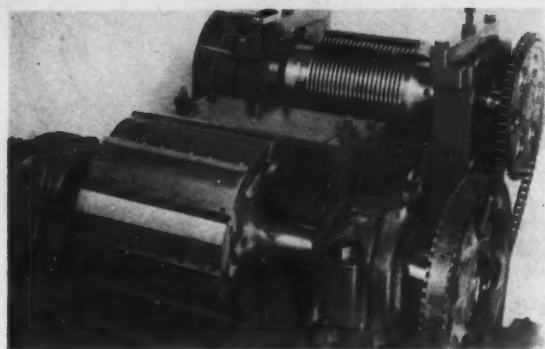
Convenient lease and  
time-payment plans.



5602

When inquiring check CP 4590 opposite last page

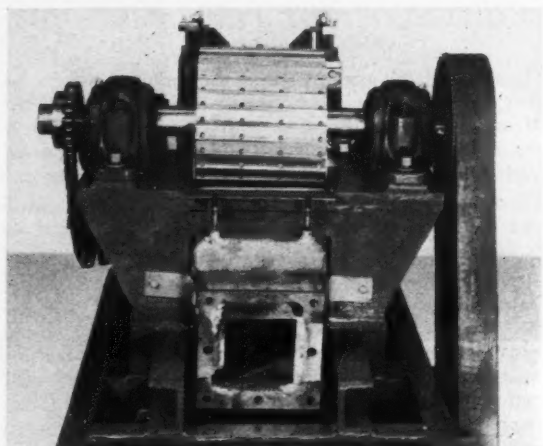




This model 710 Pelleter with circular knives and 12 fly knives is used for sheet stock.

## **IMPORTANT — TAYLOR-STILES**

### **DICERS cut uniform plastic pellets by the ton—from sheets or bars**



This 710 Model Pelleter, without circular knives, for cutting extruded bar stock, with 24 fly knives.

Producers of extruded sheets and bars find Taylor-Stiles machines, engineered to their specific requirements, give them an end product in the exact form they need.

The 700 Series, shown here, is available with or without circular knives.

With circular knives it cuts sheet stock into strips and then cross cuts them into pellets.

Without circular knives it cuts extruded bars or rods directly into pellets.

Both models are available with up to 24 fly knives.

In both types of machine Taylor-Stiles highly efficient principle of shear cutting

with its low maintenance and power costs, produces pellets of remarkably exact size — and a minimum of fines and longs.

Many of America's largest producers of plastic stock are coming to realize that Taylor-Stiles pelleters are the type that meets their requirements.

We can supply the exact type of cutting head, slitting knives, and feed arrangement to meet your production needs.

Write us today for our brochures illustrating and describing our continuous sheet, rod, or bar stock pelleters.

## **TAYLOR-STILES & COMPANY**

20 Bridge Street  
Riegelsville, New Jersey

When inquiring check CP 4591 opposite last page

## **NEW SOLUTIONS of processing problems**

### **Greater Piping Flexibility**

(Continued from page 13)

**Results:** System streamlines the overall operations and provides flexibility the engineers were originally looking for. Changeovers are made quickly and easily in a matter of minutes. "Snap-action" connectors are sanitary, corrosion-resistant, and provide positive leak-tight joints. Fittings withstand 125 psi, have Hycar gaskets, and are easily tightened by hand using wing nuts.

(Stainless fittings used in plant were supplied by Ladish Co., Tri-Clover Division, Dept. CP, Kenosha, Wis. . . . or for more information check CP 4592 on form opposite last page.)



### **Burning Sulfite Liquor**

(Continued from page 14)

cross-current action with stream of injected fuel. Air-fuel mixing and temperature of chamber dries particles of atomized liquid fuel and combustion occurs. Air is pre-heated before being fed to chamber to speed drying.

Both of Consolidated's burners are installed vertically upon main boiler furnaces. Gun feed units for fuel oil are used to start combustion. Separate pulverized coal burners firing into the secondary furnace are used to maintain steam output if supply of concentrated liquor is reduced.

Spent liquor comes from nine Mitscherlich digesters. Liquor is concentrated from 13% solids in Conkey Channel Switching Evaporators (Rosenblad patents) designed to control scaling. Evaporation train consists of five vapor bodies, two falling-film heaters and two submerged surface heaters with four effects being utilized in the process.

Precipitation of calcium sulfate, as barely-soluble anhydrite, from supersaturated solution at elevated temperatures causes heavy scaling. Switching flow through evaporators every eight hours controls the scaling. Spent liquor and steam sides are interchanged. Corrosion is controlled by using 316 stainless steel for evaporators and all equipment in contact with liquor.

Concentrated liquor has pH of around 4.0. Density is approximately 10½ lb/gal. Concentrate is heavy, highly viscous, sticky liquid similar to heavy maple syrup.

**Results:** While the company considers this plant experimental, it has been successfully burning concentrated sulfite liquor since early 1953 with Loddby burners without using auxiliary fuel to maintain combustion. The majority of the production liquor has been burned, but substantial

**No seats,  
Bends or  
Restrictions  
in this  
Valve**

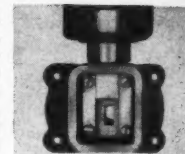


**Provides straight  
flow through port  
of any desired  
shape . . .**

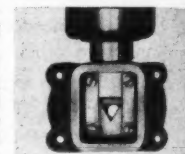
In the W. S. Rockwell Proportional Valve, the flow pattern varies only with the shape of its port. There are no seats, bends, divisions or restrictions to cause undue pressure drop. The port may be of any geometric shape to meet any feed control or proportioning requirements.

Contact surfaces of both gate and port plate are lapped smooth to provide tight contact, so that the wiping action minimizes clogging, wear and mislocation of contact. Valve may be made of any desired metal; pipe openings—¾" to 2". Control stem may be operated manually or automatically for quick opening, positioning and shut-off.

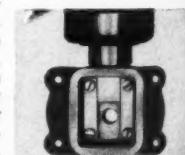
Write for bulletin.



Rectangular port opening.



Triangular port opening.



Circular port opening.

## **PROPORTIONING VALVES**

**W. S. ROCKWELL CO.**

2206 Eliot Street  
Fairfield, Conn.

VALVES: Butterfly, Slide,  
Check, Swing Gate, Special

When inquiring check CP 4593  
opposite last page

CHEMICAL PROCESSING



CP Staff Photo

Air is injected through port holes

quantities have also been sold for road-binding purposes and as industrial chemicals. Consolidated's experience indicates its unit requires only about 10% excess air and that liquors up to 57-58% solids can be handled without great difficulty. Atomization becomes a problem as percent solids approaches 60%.

(Switch evaporators are product of Chicago Bridge & Iron Co., Dept. CP, 165 Broadway Building, New York 6, N.Y. Check CP 4594 opposite last page.)

(Loddy burners are product of Combustion Engineering, Inc., Dept. CP, 200 Madison Ave., New York 16, N. Y. . . . or for more information check CP 4595 on form opposite last page.)

★ ★ ★



Ah, . . . Ahh, . . . AHHCH<sub>2</sub>CH<sub>2</sub>OOO!!

## ACTIVATED CHARCOAL PROCESSOR INCREASES YIELD FROM 53% TO

# 76%

### Single Pass Multiple Stage Milling Paid for Itself First Year!

By replacing a hammermill yielding 53% of usable product with a modern Allis-Chalmers two pair high roller mill, a charcoal processor increased his minus 10, plus 28-mesh screen yield to 76%.

Because of the increase in yield, this mill, operating with an Allis-Chalmers gyratory screen, paid for itself in less than a year!

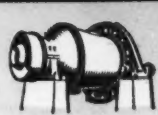
This big increase was made possible by the gentle size reduction afforded by roller mill grinding. There is no excessive shattering and no size destroying impact. And, multiple stage grinding in roller mills minimizes fines.

To meet your varying requirements in chemical processing, Allis-Chalmers roller mills are built in one, two and three pair high models. Double and triple roller mills are used when no separation is necessary between reductions. Roll lengths range from 18 to 42 inches in 9 and 10-inch diameters.

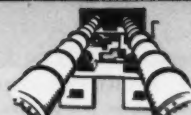
For complete information on roller mills and other equipment for your industry, call your A-C representative or write Allis-Chalmers, Milwaukee 1, Wis.



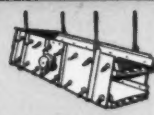
### Other Processing Equipment for the Chemical Industry



Grinding Mills



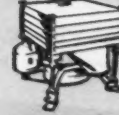
Kilns, Dryers, Coolers



Vibrating Screens



Compacting Mills



Gyratory Screens



Man-Lifts

# ALLIS-CHALMERS



When inquiring check CP 4596 opposite last page





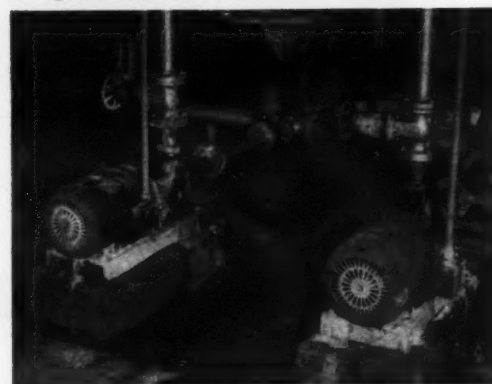
**WHERE DUST PREVAILS**—A 60 hp, 1160 rpm Wagner motor drives this pulverizer which grinds down oversize fertilizer. Its totally-enclosed construction keeps fertilizer dust out and mechanical and electrical stability in.



**PERMITS OUTDOOR OPERATION**—This Wagner 15 hp, totally-enclosed, fan-cooled motor drives an agitator which mixes hydrated lime with plant water. This motor's totally-enclosed, corrosion-resistant, cast-iron construction protects it from the elements and keeps it always "on the job."



**AT REDUCED SPEED**—In this application, a 100 hp, 1160 rpm Wagner motor drives a Rotary Fertilizer Drier at 5 rpm through a Falk Motoreducer.



**IN CORROSIVE ATMOSPHERE**—These 5 hp, 3500 rpm Wagner motors drive pumps that handle 93% sulphuric acid. But even sulphuric acid is no deterrent to the reliable operation of these motors because of their corrosion-resistant cast-iron frames and totally-enclosed construction.

## Wagner Standard Motors do specialized jobs at Missouri fertilizer plant

The Missouri Farmers Association has its own fertilizer plant in Joplin, Missouri. Technically, it is called a "high analysis granulating unit." Principal chemical compounds manufactured are phosphoric acid and ammonium phosphates. With an annual capacity of 70,000 tons of fertilizer, this farmer-owned plant is one of two of its kind in North America.

In this plant, designed by the Dorr Company and built by Merritt-Chapman and Scott Corporation, you'll find more than 100 standard Wagner totally-enclosed motors providing the power for pulverizers, grinders, blowers, conveyors and pumps, operating under adverse conditions—where open-type motors would quickly fail.

Whether it's a job of producing plant food or any of hundreds of other industrial operations . . . Wagner Standard Motors can do the job reliably, economically and well. Wagner engineers are qualified to specify the correct motors for your requirements. Consult the nearest of our 32 branch offices—or write for Bulletins MU-132 and MU-203.

**Wagner Electric Corporation**  
6339 Plymouth Ave. • St. Louis 14, Mo., U.S.A.



BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES • AUTOMOTIVE BRAKE SYSTEMS - AIR AND HYDRAULIC

## NEW SOLUTIONS

### Grate magnets remove low-ferrous impurities from sand . . .

cut rejects, boost production in pottery plant

**Problem:** High percentage of dinnerware rejects, due to spotting and specking, was seriously affecting production at Buffalo Pottery Company, Buffalo, New York. Trouble was traced to presence of very fine particles of slag in the sand used in making the ware. Problem was to find a method of removing these impurities — some of such low ferrous content that they barely react to a test magnet.

**Solution:** A six-unit tier of non-electric grate magnets was installed immediately below a gyratory riddle to which the sand is fed at rate of 10 tons per hour. Grates are housed in a plywood casing provided with a door to permit individual grates to be slid out of their racks to remove accumulated contaminants.

Each grate consists of a parallel row of stainless steel tubes containing magnetic elements of Alnico V metal. Tubes, normally spaced on two-inch centers in a steel frame, are protected by a removable steel grill which also serves to spread and direct the flow of material.

**Results:** Efficiency of magnets is such that rejects due to spotting and specking have been virtually eliminated. Examination of grates reveals that the lowest magnetic impurities are removed by the bottom grate. Material collected here contains so little imbedded iron that it can be picked up only by actual contact with a strong test magnet.

(Non-electric grate magnets are product of Eriez Manufacturing Company, Dept. CP, Erie, Pa. Check CP 4597 opp. last page.)

For more information on product at left, specify CP 4598 . . . see information request blank opposite last page.

CHEMICAL PROCESSING



### Electrostatic precipitator case histories

Number of case histories presented in 16-page bulletin tell how air pollution has been stopped, materials reclaimed, and gases purified through the use of electrostatic precipitators. Different models of the unit available are described in detail and shown in sectional views.

"Electrostatic Precipitators" is issued by Metal Products Div., Koppers Co., Inc., Dept. CP, 200 Scott St., Baltimore 3, Md. When inquiring specify CP 4599 on form which is located opposite last page.

### SHARE THE GAG!



Has it ever struck you that there are moments when chemical processing becomes comical processing? Next time something funny happens in the plant or lab, why not share the laugh with CHEMICAL PROCESSING readers?

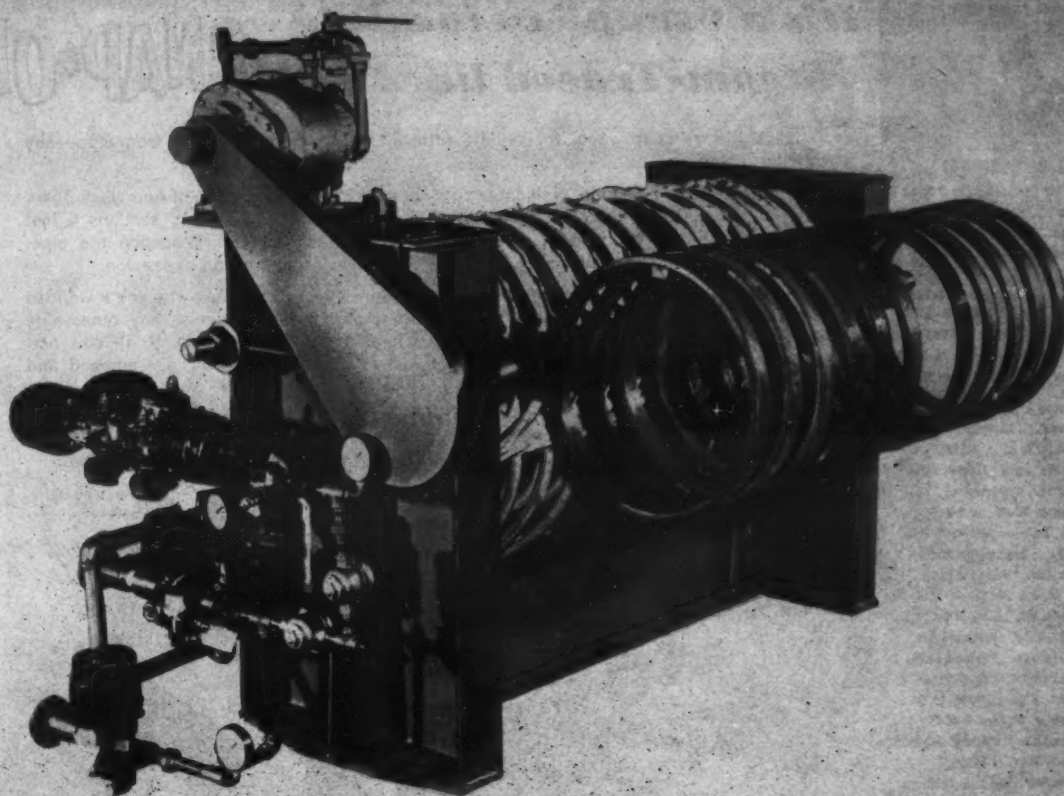
If you can draw, send your cartoon in black ink on an 8 1/2 x 11" sheet, ready to reproduce. We'll pay you \$10 if it is accepted.

If you have a cartoon idea you can't draw, send in a description or rough sketch of the scene, and the caption. We'll send you \$5 on acceptance.

Send your cartoon or idea to:

Cartoon Editor  
CHEMICAL PROCESSING  
111 East Delaware Place  
Chicago 11, Illinois

Be sure to include your name, position, company, and address.



## AUTOMATIC CYCLING OF PLATE AND FRAME TYPE FILTER PRESSES

Automatic, practically continuous, filtration is now available in a plate and frame type of filter with the Eimco-Burwell Filter.

This filter developed to give a high rate of filtration on difficult, hard to filter, slurries where the particle size is measured in microns and where the filtrate must be brilliantly clear, has been used on slurries previously believed unfilterable on any automatic or semi-automatic filter.

These Eimco-Burwell filters have in many cases improved the conditions in the plant by: (1) producing a clearer filtrate, (2) increasing the capac-

ity of the filter station on amount filtered per square foot of filter area per hour. (3) Reducing to practically zero the shut down time required for cleaning. (4) Increasing media life per ton of production. (5) Reducing the operator's physical labor. (6) Washing out more of the soluble values. (7) Upgrading the concentrate to a more salable product, and in many other ways increasing the general plant efficiency.

Let Eimco provide you with data on filtration of products similar to your own on an Eimco Filter designed to specifically handle that material.

**THE EIMCO CORPORATION**  
Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

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When inquiring check CP 4600 opposite last page

## It's a "snap" to insulate Steam-Traced lines with **SNAP\*ON**

... and it's a "snap", too, to insulate fittings, bends, couplings, cast iron pipe—any irregular piping.

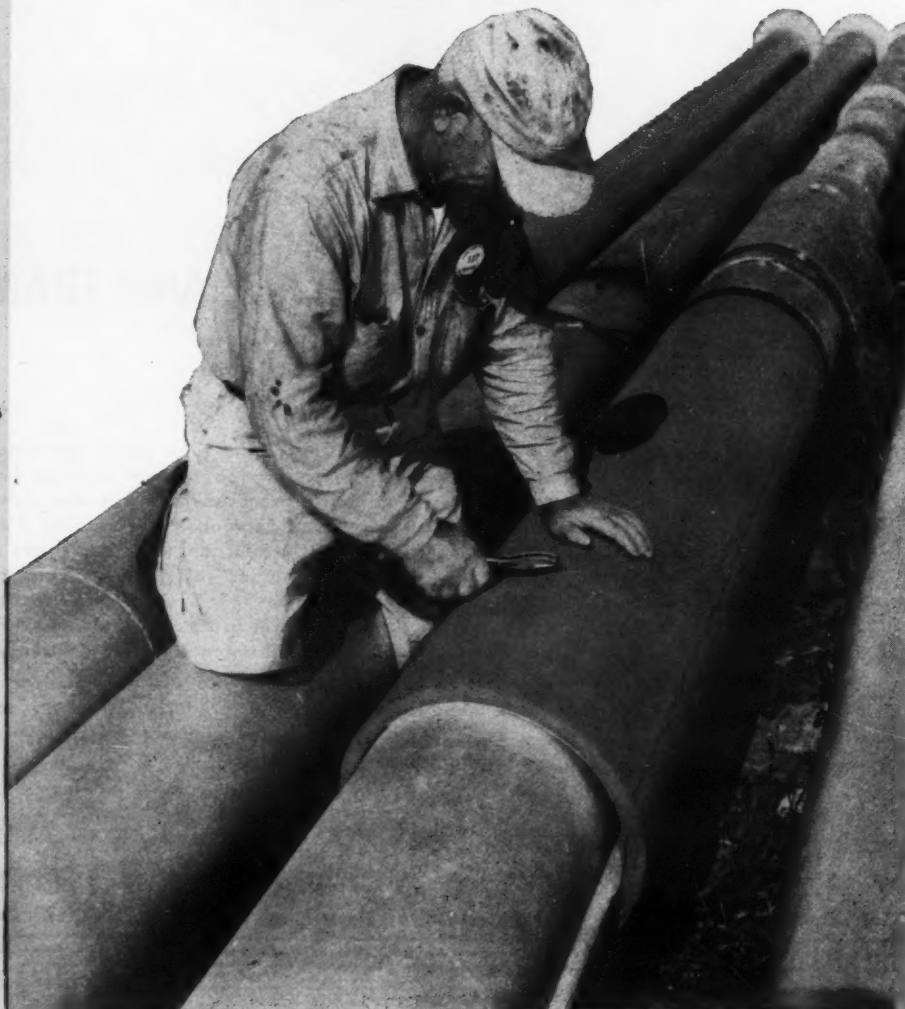
Snap\*On is a flexible, resilient, one-piece pipe insulation molded of fine glass fibers that actually snaps on the pipe. Made in sizes up to 33" I. P. S. and in sections 6 feet long, Snap\*On cuts the cost of insulating big pipe to a minimum. Once on the pipe, Snap\*On's flexibility prevents cracking under thermal contraction and expansion.

Snug fit and easy application are by no means the only reasons why you'll want to use Snap\*On for both hot and cold piping. Thermally, it is superior to any other pipe insulation on the market. It's clean and dustfree. It's attractive, easy to finish. And Snap\*On is as permanent as a pipe insulation can be, yet can easily be removed and reused. If you can't say as much for your present pipe insulation—

**CALL YOUR LOCAL SNAP\*ON DISTRIBUTOR TODAY**  
(HIS PHONE NUMBER IS IN THE ADJOINING COLUMN) **OR**  
**WRITE FOR YOUR COPY OF NEW SNAP\*ON BROCHURE**

# GUSTIN-BACON *Manufacturing Company*

254 W. 10th St., Kansas City, Mo.



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See our catalogs in  
Sweet's Architectural &  
Plant Engineering Files



When inquiring check CP 4601 opposite last page

### NEW SOLUTIONS of processing problems

**No maintenance in three years  
on stainless filter handling  
corrosive NH<sub>4</sub> NO<sub>3</sub>...**

unit runs virtually unattended; operating,  
cleaning take only part of one man's time

**Problem:** An efficient method of filtering hot, corrosive 60% ammonium nitrate solution was sought by Mississippi Chemical Corporation, Yazoo City, Mississippi. Operation is part of overall process for reprocessing over-size prills and other recovered ammonium nitrate dusts and fines from the plant.



CP Staff Photo

Filter operates virtually unattended

Although ammonium nitrate doesn't present any particular corrosion problem when dry, it does become severely corrosive when it picks up moisture and goes into solution. At Mississippi Chemical, the dry material is dissolved in water, heated to 200°F, and recycled back into main process stream. Any foreign particles that may be present in the solution, must be removed — failure to do so can result in serious explosion hazard later in process.

**Solution:** Company installed a stainless steel, vertical-leaf filter in the recirculation system. Measuring 3 x 5 ft, unit is capable of handling up to 18 gpm at 65 psi. Constructed of 304 stainless steel, filter has 35 sq ft filtering area. Particles as small as 2 microns can be removed.

Unit requires no cloths or paper. Cleaning takes only a few minutes, with minimum interruption in production. Filter is quickly opened, leaves lifted out (there are seven), and washed down with water hose. After being reassembled, unit is



precoated with Dicalite filter aid before filtration is resumed.

**Results:** In service for almost three years, filter has performed smoothly and efficiently. It has successfully resisted the corrosive solution and shows no sign of wear. Cleaning is performed once per shift. Operation otherwise is virtually unattended — taking only part of one man's time.

(Model 35-20, vertical-leaf, stainless steel filter was supplied by Niagara Filters, a division of American Machine and Metals, Inc., Dept. CP, East Moline, Illinois . . . or for more information about manufacturer's product, reader may simply check CP 4602 on the convenient Reader Service slip which is located opposite last page.)

### "King-size" heating mantle for gas-phase reactor

Uniform, effective heating on a production-scale gas-phase reactor is being accomplished by the use of a "king-size" electric heating mantle. Considered by the manufacturer to be one of the trickiest jobs he ever tackled, the mantle has a total of 13 open-



ings. In addition, there are three viewing windows — one for each of the reactor's three sight glasses. Windows are covered by insulating flaps which can be swung back when viewing is desired.

(Electric heating mantles are product of Glas-Col Apparatus Company, Dept. CP, 711 Hulman Street, Terre Haute, Indiana . . . or for more information about manufacturer's product, reader may simply check CP 4603 on form which is located opposite last page.)

## Mr. Engineer: Cut Your Pump Inventory—Reduce Costs With These New, Proved Pumps

**TYPE DL**  
grease lubricated housing

**TYPE DM**  
oil lubricated housing

**PEERLESS PUMPS**

*a new concept of economy through interchangeability of components!*

### New PEERLESS type DL & DM PROCESS PUMPS ALSO FEATURE:

**ACCESSIBILITY**—Through ease of assembly and disassembly if and when required. **DURABILITY**—Through use of any machinable metal as materials of construction. **SERVICEABILITY**—Through designs that feature maximum ease of maintenance. **INTERCHANGEABILITY**—Through a choice of semi-open or enclosed impellers, oil or grease lubrication, air- or water-cooled back plates and bearing housings. **RELIABILITY**—Through the high performance standards set for these pumps, proving more than ever before, that Peerless Builds Dependable Pumps. **AVAILABILITY**—Through shipment from stock of both complete pumps and pump components.

#### Other pertinent Type DL-Type DM facts:

Peerless Type DL and Type DM process pumps are available in 1", 2", 2½" and 3" sizes on an 8½" frame and in 1", 2", 2½", 3" and 4" sizes on a 10½" frame. **CAPACITIES:** up to 800 gpm. **HEAD RANGE:** up to 430 feet. **DRIVES:** motor or steam turbine. **TEMPERATURE RANGE:** grease lubricated housing up to 250°F.; oil lubricated housing up to 450°F. **WORKING PRESSURES:** up to 400 psig.

*Write for your Slide Selector now. Use coupon for quick action.*

### PEERLESS PUMP DIVISION FOOD MACHINERY AND CHEMICAL CORPORATION

Factories: Indianapolis 8, Indiana and Los Angeles 31, California  
Offices: New York, Indianapolis, Chicago, St. Louis, Atlanta, Lubbock and Plainview, Texas; Fresno, Los Angeles, Phoenix, Albuquerque.  
Distributors in Principal Cities. Consult your local Telephone Directory.



### Here is INTERCHANGEABILITY IN ACTION —

Interchangeability of component parts for DL-DM pumps is graphically shown by this slide selector. Write for your FREE copy. It shows how liquid end components are accommodated on either grease lubricated or oil lubricated bearing housings. Also provides quick reference to pump specifications and performance characteristics.

PEERLESS PUMP DIVISION  
Food Machinery and Chemical Corporation  
301 West Avenue 26, Los Angeles 31, California

Please send chemical process pump selector DR-1

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

CP

When inquiring check CP 4604 opposite last page



## How one specific PRESSURE PROBLEM was solved



Shown above is a high-capacity low-speed intensifier unit, designed and manufactured by Watson-Stillman for long, trouble-free service in a petrochemical plant.

Its design is a sound approach to the problems of packing and fatigue life at pressures up to 100,000 psi. Because of its slow piston speed, and resultant low-rubbing velocity, packings last longer.

Slower cycling speed reduces the number of stress reversals and increases fatigue life in high-pressure cylinder and block. At this low speed of operation, you can expect ten to twelve times the life of comparable high-speed equipment.

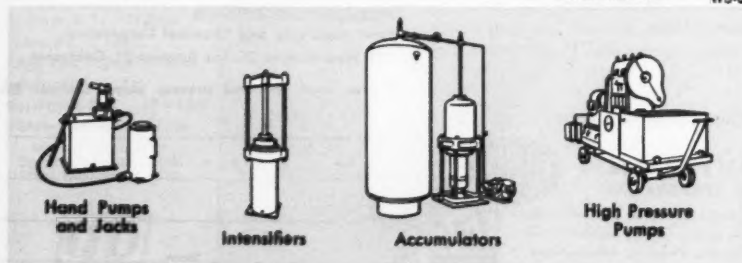
This is only one of the many outstanding examples of the way in which Watson-Stillman solves pressure problems. Whether you need special or standard hydraulic equipment for pressure testing, research, development or production, it will pay you to consult Watson-Stillman.

**WATSON-STILLMAN PRESS DIVISION**  
**FARREL-BIRMINGHAM COMPANY, INC.**

190 Aldene Road, Roselle, New Jersey



ESTABLISHED 1848 W5-8



When inquiring check CP 4605 opposite last page

## NEW SOLUTIONS of processing problems

**Separator has no moving parts;  
drains automatically;  
is maintenance-free . . .**

recovers virtually 100 per cent of mist, liquids present in natural gas

Low-cost entrainment separator has successfully passed operating tests at the Sweetie-Peck Compressor Station of El Paso Natural Gas Company. Installed in a vertical downflow position immediately ahead of a tank-type gas scrubber, the unit handles 3.5 MMSCFD of 90°F natural gas (sg gr 0.52) at 150 psi.

Device separates all liquid and mist entrainment from hydrocarbon gases by means of a patented two-stage principle of separation. First stage utilizes controlled impingement against a baffle which removes the larger droplets from the gas. Second stage removes remaining fine mists by controlled centrifugal force.

Unit is said to recover virtually 100 per cent of recoverable liquid present in natural gas, at a saving in capital investment of up to 500 per cent over conventional tank-type scrubbers. Since there are no moving parts, it is virtually maintenance-free. Entrainment is drained automatically and continuously through drain outlet at bottom of unit by means of a float-type trap. Standard units are available in 2½ to 10" pipe sizes, with design pressures up to 300 psi.

(Hi-EF Type L Purifiers are product of the V. D. Anderson Company, Dept. CP, 1935 West 96th Street, Cleveland 2, Ohio . . . or for more information reader may simply check CP 4606 on the convenient Reader Service slip which is located opposite last page.)

### Correction Notice

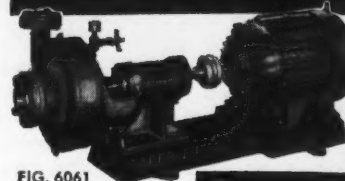
In the article on pages 14 and 15 of February CHEMICAL PROCESSING — "Streamlined Sulfuric Acid Plant" — name of the manufacturer of the evaporative cooler was incorrectly given.

The cooler is a product of Heat Transfer Div., National-U.S. Radiator Corp., Dept. CP, 221 Central Ave., Johnstown, Pa.



Evaporative cooler for sulfuric acid is directly behind tank truck

for **PUMPING  
CHEMICAL  
SOLUTIONS!**



Write for  
**TABER  
BULLETINS  
C-355  
for  
HORIZONTAL  
PUMPS  
...  
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V-837**

Fig. 19,488

**TABER PUMPS ARE**  
specially built for  
handling chemical solu-  
tions, efficiently and  
economically . . . in the  
processing industries.  
The Vertical design  
permits locating stuff-  
ing box above and  
out of liquid level.  
Therefore nothing  
to leak.  
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as above gladly  
sent on request.  
**TABER PUMP CO**  
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**TABER**

When inquiring check CP 4607  
opposite last page

CHEMICAL PROCESSING

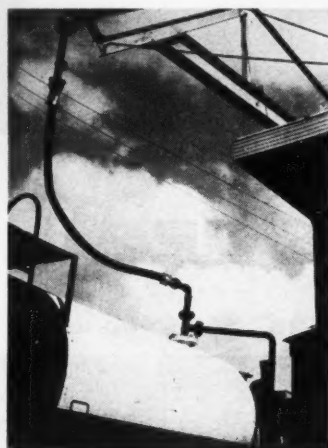
## NEW SOLUTIONS

### Two years $H_2SO_4$ service — hose speeds unloading of tank transports . . .

flexibility permits quicker  
spotting of trucks

**Problem:** Variations in truck and fitting locations precluded the use of rigid pipe connections in transferring battery acid from 15-ton tank truck transports to a roof storage tank at Reading Batteries' Reading, Pennsylvania plant. Pressures up to 30 pounds were used to raise the sulfuric acid to storage tank level. Free unloading time, before demurrage started, was one hour.

**Solution:** In January of 1953, Reading installed a hose lined with Hypalon, DuPont's chemical rubber based on chlorosulfonated polyethylene, as a flexible connection between truck and lead-lined



Hypalon hose connects truck with  
lead-lined storage tank piping

pipe leading to storage tank. Hose has carcass of multiple plies of high tensile duck and a cover of pure gum rubber. It is stored in wooden cabinet located outside and subjected to normal summer and winter temperatures.

(Please turn to next page)

For more information on product at right, specify CP 4608 . . . see information request blank opposite last page.

## What are your refractory castable problems



- High Temperatures?
- Abrasion and Erosion?
- Slag Attack?
- Overhead Applications?
- Insulating Properties Required?

B&W makes a wide range of specialized refractory castables. Whatever your problem, you will find helpful data in B&W Bulletin R-35. Send for your copy today.



### Table of Products and Uses

	Page		Page
<b>Castables</b>		<b>B&amp;W Kromecast</b>	
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Special High Temperature Service—To 3200 F			
<b>B&amp;W Kaocast</b>	8-9	<b>B&amp;W Hydrochrome</b>	
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For Extra Strength and Abrasion Resistance—To 2500 F			

## BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.  
REFRACTORIES DIVISION  
GENERAL OFFICES: 161 EAST 42nd ST., NEW YORK 17, N.Y.  
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## NEW SOLUTIONS

(Continued from preceding page)

**Results:** Hose flexibility permits quick, easy coupling and uncoupling when unloading trucks. Deliveries are made approximately three times a month. Hose has been in service without any failures since first installed. Pressures required are successfully handled and unloading is accomplished within allowed free time.

(Maltese Cross Hypalon acid hose is product of Hewitt-Robins, Inc., Dept. CP, 666 Glenbrook Rd., Stamford, Conn. . . . or for more information check CP 4609 on form which is located opposite last page.)

### **Celanese lowers costs for air conditioning with roof coolers . . .**

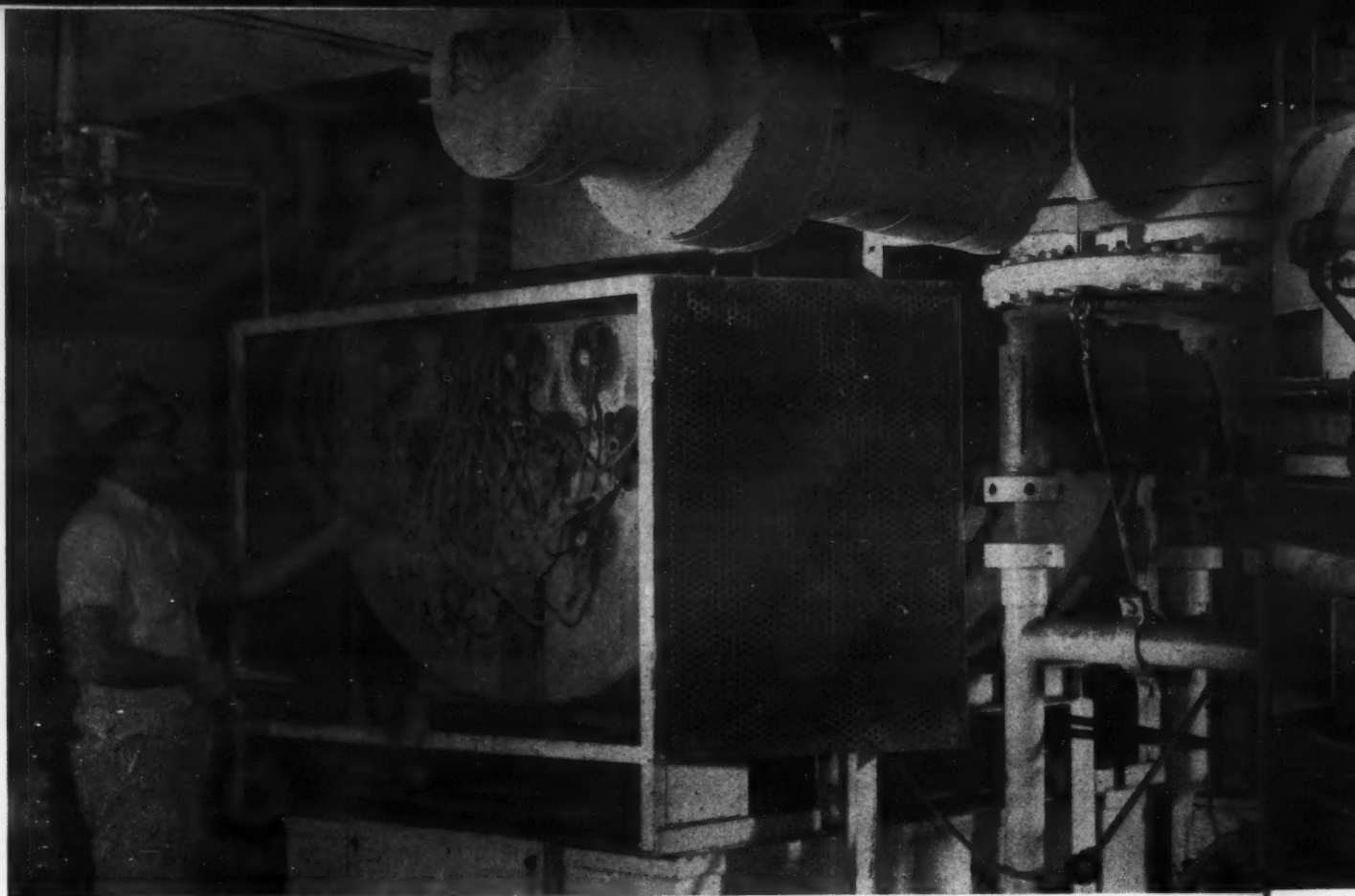
reduce construction expense,  
improve working conditions

**Problem:** Sun heat transmitted through roof of air conditioned production areas in Celanese Corp. of America's Rock Hill, South Carolina, plant, caused a variation of 10°F between floor and ceiling and raised room temperature 5°F. Air conditioning equipment was heavily loaded.

In other operating areas ceiling surface temperatures as high as 110°F were measured. Since ceiling is underside of roof, working conditions in building were not conducive to the most efficient operation.

**Solution:** In 1951 Celanese installed a system of roof cooler spray nozzles. Nozzles are designed to deliver just enough water to keep roof slightly moist so that natural evaporation can take place. Unit shown in photograph provides a highly effective coverage per gallon of water.

A typical rotary unit covering a circle with a 57' diameter, sufficient for a roof 60 x 60', needs water pressure of 30 psi and uses 95.6 gph. Variations in water pressure change area covered and amount used. Water should be



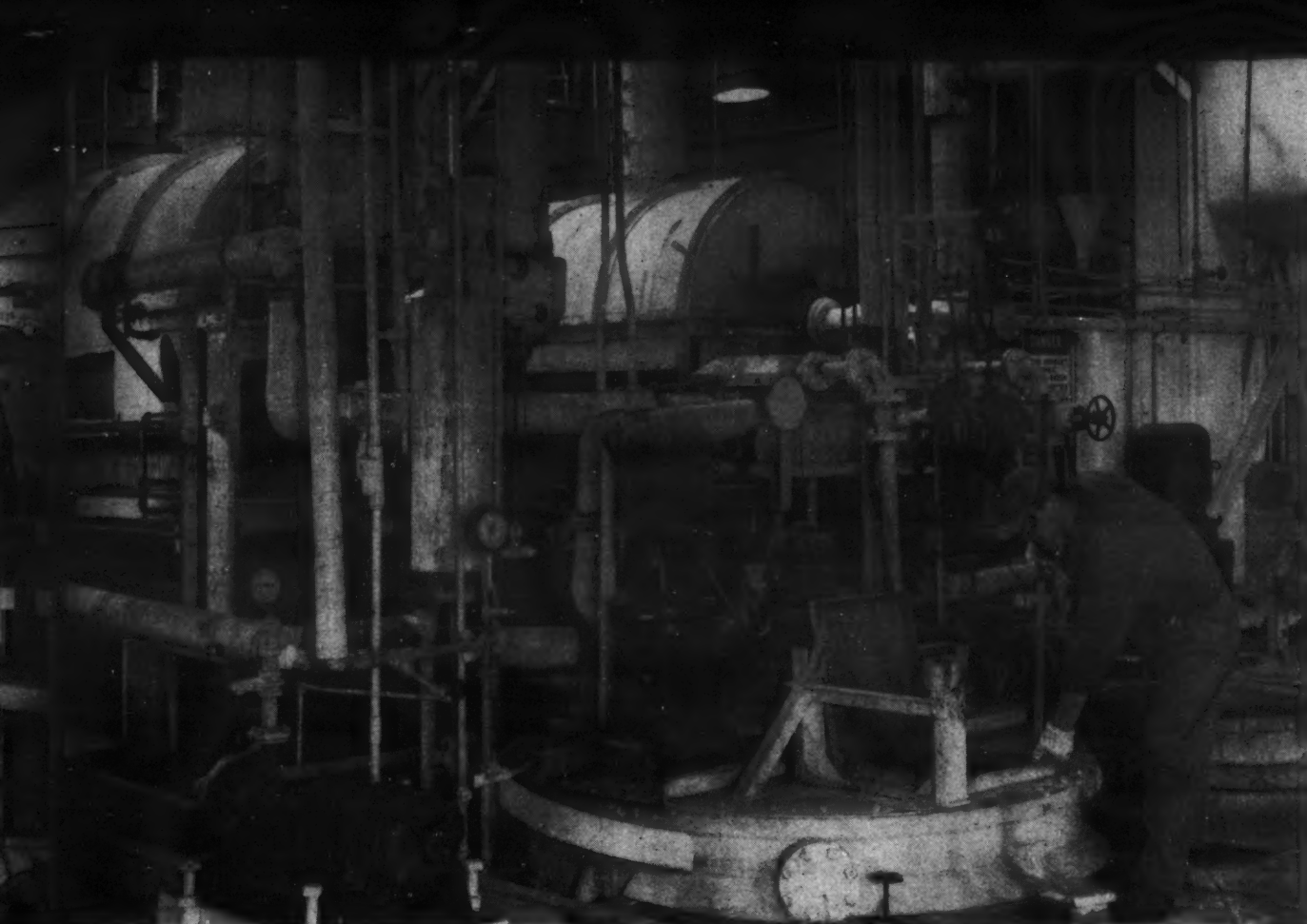
PRE-HEATED SULFUR is combined with pre-heated hydrogen in Stainless Steel catalyst chamber to form hydrogen sulfide gas.

## HOW STAINLESS STEEL

SODIUM SULFHYDRATE comes through Stainless tubing into this Stainless filter press and is pumped into Stainless weigh tanks.







AFTER FILTRATION, the solution is pumped to these flaker feed tanks, equipped with Stainless pumps, agitators and piping.

## UPHOLDS PURITY in sodium sulfide production

AT HOOKER ELECTROCHEMICAL COMPANY, NIAGARA FALLS, N.Y.

Hooker Electrochemical Company, Niagara Falls, N.Y., is a major factor in the marketing of sodium sulfide in the United States; and the firm goes to extraordinary lengths to protect its market by maintaining the highest standards of purity.

Almost automatically, this means the generous use of Stainless Steel where there is the slightest danger of contamination, resulting from corrosion. Stainless Steel serves in the sulfur boiler, pipelines, condensers, separators, filter presses, pumps, flakers and agitators.

Besides guarding purity, Stainless Steel often simplifies design. The agitators, for instance, could be made much larger, because the strength of Stainless permits it to operate at such a high stress level. Hooker had no trouble fabricating their Stainless equipment; in fact, it was practically all done locally.

To guard purity, resist corrosion, withstand high stresses and temperatures, nothing can equal Stainless Steel for chemical equipment. To be sure of service-tested quality, specify USS Stainless Steel.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO  
NATIONAL TUBE DIVISION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS  
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

# USS STAINLESS STEEL

SHEETS • STRIP • PLATES • BARS • BILLETS • PIPE • TUBES • WIRE • SPECIAL SECTIONS



UNITED STATES STEEL

## NEW SOLUTIONS

free of suspended solids.

**Results:** Roof sprays in air conditioned areas have made it possible to maintain more uniform room conditions while reducing load, and operating costs, on air conditioning equipment. Sprays on areas not air conditioned lowered ceiling temperatures up to 10°F and reduced



Roof cooler at Celanese

room temperatures sufficiently to permit workers to carry on normal operations.

If roof sprays are considered during design stages of building, lighter roof construction is possible. With air conditioning heat load is less, reducing cost of initial installation, and lowering operating costs. Production space is gained since equipment is smaller.

(Roof coolers are a product of Ruppriht's Rotary Roof Cooler, Dept. CP, PO Box 6795, Los Angeles 22, Calif. Check CP 4610 opposite last page.)

This month's  
Engineering Data Section,  
dealing with chemical materials, starts on page 74

For more information on product at left, specify CP 4611 . . . see information request blank opposite last page.

**"Effective communication . . .  
can reduce time and costs of  
market development . . .  
build confidence and respect  
for the company supplying  
the product."**



*Dr. Bateman received his B.S. from Ursinus College in 1931, then attended the University of Pennsylvania from which he obtained his M.S. in 1933 and his Ph.D. in 1935. In July 1935, he joined the Organic Synthesis Fellowship of Carbide and Carbon Chemicals Company at Mellon Institute, was transferred to the company's Fine Chemicals Div. in 1937. Was named Manager of the Division in 1944. Appointed to the newly created position of Director of Product Development in 1954.*

## **communications** **vital force in commercial chemical development**

**DR. ROBERT L. BATEMAN**

Director of Product Development,  
Carbide and Carbon Chemicals Company

President, Commercial Chemical  
Development Association

**C**ONTINUED growth of the chemical industry depends to an important degree upon the successful introduction and distribution of new products. With research laboratories pouring forth about 5000 new chemicals a year, this places an increasing burden upon the ingenuity of market development organizations. Not only will this burden grow heavier, but vastly more complex with increased research expenditures and tightening competitive markets.

In light of this situation, effective communications is the key link needed to tie together efforts of commercial chemical development organizations and their potential customers. The "Materials" section featured in *CHEMICAL PROCESSING* is an example of one means of commercial development of new products from chemical laboratories.

The history of products that have grown to commercial importance indicates that effective distribution of information both within an organization and to the prospect is vital. If the role of communications

could be more fully utilized and improved upon, it's conceivable that the proverbial "seven years from test tube to tank car" can be shortened. Economies thus realized could be passed on to customers, allowing them to more fully develop their markets and add to the expansion of our overall economy.

Within organizations, interchange of information must be maintained between sales personnel, plant production, and supporting groups such as research, patent, law, and sales promotion. The importance of this co-ordination is highlighted when the many factors involved in a development program are considered. These include market research, physical and chemical properties, product specifications, physiological data and labeling, patent considerations, sales promotional activities, use and product research, shipping and distribution, and pricing. Unless all groups are kept up to date and their efforts co-ordinated, a product might be launched prematurely without proper groundwork. The result is failure to

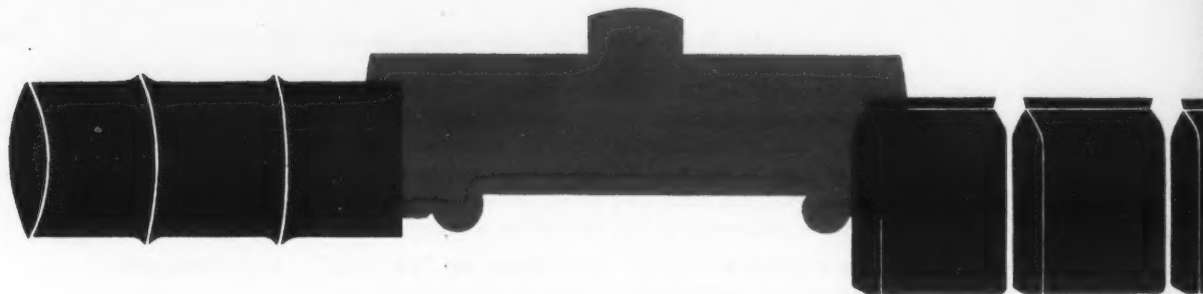
develop a market or costly delays.

When samples and technical data are ready for distribution, publicity releases, house organ articles, advertisements, and trade show exhibits serve to announce the availability of a new product. Direct mailing to potential customers offering samples and technical data are also important in the initial marketing program. Interesting and well-written technical articles prepared for the press, and publication of application results derived from the producer's laboratories are excellent adjuncts in helping to generate interest in a new product.

Technical presentations at society meetings provide an excellent opportunity to concentrate and accelerate dissemination of information to prospects.

Finally, technical representatives must be constantly brought up to date once the product enters a prospect's research program. For it is the technical representative who must keep a free flow of ideas and technical information moving to the customer, while also helping him solve development problems.

Effective communications not only can reduce time and costs of market development but also build confidence and respect for the company supplying the product.



*starts here — a spotlight on*

## **chemical materials**

### ***introduced in 1955***

In addition to the regular articles about latest chemical developments, this month's Materials section includes CHEMICAL PROCESSING's Annual Survey of Chemical Materials introduced during the previous year.

To help you locate quickly and easily just what you might need for a specific application, we've indexed all 665 items by their suggested uses. This year's Use-Index starts on the next page. It is even easier to use than last year's.

The descriptive list of 1955 developments in chemical materials is in two parts: Commercially available materials (page 34) and developmental-scale materials (page 64). This completely separates materials that are available for large-scale manufacturing from those that are still in an introductory stage. Also, as many of you suggested, we are indicating "chemical firsts" . . . new materials never before available . . . in both listings.

## **section index**

*Here's where you'll find the features  
of this month's regular Materials section*

	STARTS ON
Use-Index of suggested applications of all materials in both of the following lists .....	Page 32
<b>Chemical Materials Introduced in 1955</b>	
1) Commercially available materials .....	Page 34
2) Developmental-scale materials .....	Page 64
<b>Organo-Boron Compounds</b> — What seven promising newcomers have to offer you .....	Page 63
<b>Reference Data</b> — Nomograph for vapor pressures of 36 solvents, a color comparison and conversion chart, and a rapid neutralization calculator .....	Page 74
<b>Chemical Manufacturers</b> — Their names and addresses, so you can get more details .....	Page 82



# chemicals use-index

use it to spot what you need, quickly and easily



Looking for a chemical material to fill a specific need? All chemicals in the two lists of new chemical materials announced in 1955, starting on page 34 and page 64, are indexed here by their suggested uses. Product is either used directly for use indicated, or as a material in preparation of the end product indicated.

To locate a specific item quickly, check through this "Use-Index," then look up, by number, those chemicals which interest you.

Numbers below 500 refer to commercially available chemicals, as described in first list (page 34). Numbers over 500 refer to chemicals available only in developmental-scale quantities, as described in second list (page 64).

Full names and addresses of manufacturers are given in Manufacturers Listing, page 82.

<b>Absorbents</b>	362, 694	<b>Defoamers</b>	132, 176, 319, 369	<b>Hydraulic Fluids</b>	209, 371, 571, 613
<b>Adhesives</b>	6, 7, 10-12, 24, 105, 298, 298A, 298B, 360, 388-389, 700	<b>Dehydrating Agents</b>	316	<b>Inhibitors, Corrosion</b>	32, 144, 158-159, 169, 195, 284, 343, 350, 503, 521, 538, 560, 592, 596, 624, 665, 706
<b>Adsorbents</b>	8, 232	<b>Demulsifiers</b>	15, 177, 284	<b>Insecticides</b>	142, 184, 240, 347, 507, 546, 566, 584, 617, 625, 652, 728, 733
<b>Agricultural Chemicals</b>	44-45, 118, 191, 260, 271, 358, 376, 390-391, 393-394, 397, 516, 528	<b>Desizing Agents</b>	141	<b>Insulating Materials</b>	214, 231, 336-337, 727
<b>Anticaking Agents</b>	90, 314-315	<b>Detergents</b>	185-186, 203, 222-223, 242, 245, 247, 264-265, 282, 296, 384, 597, 617, 713	<b>Intermediates (NEC)</b>	13, 50-51, 63, 67-69, 72-74, 83-84, 99-100, 104, 112-113, 143, 145, 156, 174, 183, 188, 196, 225, 231, 233, 238, 244, 246, 255, 256, 272, 303, 341, 364, 377, 383, 506, 508-509, 511, 517, 522, 530, 536, 545, 551-552, 554-555, 558, 570, 573, 575-577, 579, 583, 588-590, 599-601, 612, 614, 618-619, 621, 623, 629-630, 632-633, 641-643, 646, 649, 653, 656, 660, 671, 678, 685, 689, 691, 712, 714, 717-718, 721, 724-725, 732, 735, 738-742
<b>Antifoaming Agents (See Defoamers)</b>		<b>Dispersants</b>	7, 14, 48, 175, 187, 339, 349, 591	<b>Leather</b>	26, 201, 343
<b>Antioxidants</b>	53-54, 172, 224, 266, 355, 596	<b>Dyes and Pigments</b>	2, 25, 52, 55, 60-62, 71, 92-98, 101-103, 109, 122, 151, 172, 179A, 219, 219A, 228, 254, 259, 270, 275, 277-278, 304, 351-353, 366, 376, 380-381, 400-401, 404, 507, 523, 546, 572, 607, 662, 666, 682, 733	<b>Lubricants and Additives</b>	27, 59, 115A, 130, 158, 160, 169, 237, 290, 322-324, 328, 354, 376, 540, 542, 565, 597, 617, 626, 696, 748
<b>Antistatic Agents</b>	42, 604, 688	<b>Elastomers</b>	5, 78, 557	<b>Odorants</b>	23, 64, 202, 398, 400, 537, 640, 718
<b>Batteries</b>	235, 521	<b>Electroplating Chemicals</b>	650	<b>Oxidizing Agents</b>	47, 207, 261, 300, 342, 547, 553
<b>Biochemicals</b>	9, 129, 135-138, 149, 153, 204-205, 211, 681, 683	<b>Emulsions</b>	22, 146, 357	<b>Pharmaceuticals</b>	9, 87, 107A, 115, 120, 149, 170-171, 192, 197, 219A, 230, 234, 250, 345, 363, 376, 385, 398A, 400, 505, 520, 529, 534, 537, 541, 562, 568-569, 574, 586-587, 605, 607, 620, 625, 635, 638, 645, 666, 679, 692, 719, 722, 728, 733, 747
<b>Biocides</b>	32, 115-116, 134, 212-213, 221A, 240, 347, 505, 527, 542, 687, 715	<b>Emulsifiers</b>	15, 33, 56, 86, 158, 169, 186, 201, 203, 223, 281, 282, 296, 370, 503	<b>Plasticizers</b>	3B, 29-31, 34, 110, 130-131, 154-155, 161-167, 180, 182, 199, 209, 215-216, 237, 241, 243, 248, 258, 267, 273, 276, 313, 371, 382, 386, 402, 502, 515, 539, 548, 561, 563, 580, 609, 613, 615, 626, 637, 639-640, 667, 690, 736-737
<b>Catalysts, Chemical Reaction</b>	66, 117, 317-318, 606	<b>Extenders</b>	105, 525, 661	<b>Plastic Ingredients</b>	37, 99, 175, 275, 293, 519, 535, 546, 566, 569, 593, 602, 657-658, 663, 669, 680, 695
<b>Ceramics</b>	38, 59, 231	<b>Fat and Oil Refining</b>	4	<b>Plastics, Compounded</b>	139, 214, 288, 310, 526, 631, 644, 673, 698
<b>Chelating Agents</b>	3A, 40, 89, 191, 343, 348, 603	<b>Fillers</b>	59, 109, 693		
<b>Cleaners</b>	340, 343	<b>Flame Retardants</b>	52, 110-111, 170, 305, 525, 611		
<b>Coatings</b>	106, 168, 181, 198, 200, 217, 243, 299, 333, 371, 533, 556, 636, 715	<b>Flatting Agents</b>	314-315, 693		
<b>Color Removers</b>	232, 308-309, 399	<b>Flavors</b>	88A, 615, 640		
<b>Colors (See Dyes and Pigments)</b>		<b>Flocculating Agents</b>	7, 285		
<b>Comonomers and Copolymers</b>	76-77, 79-82, 146-148, 248A, 346, 359, 504, 524, 540, 543-544, 549, 568A, 580-582, 594, 670, 674, 729, 743	<b>Frothing Agents</b>	185, 513		
<b>Cosmetics</b>	46, 140, 186, 197, 225, 315, 322, 344-345, 356, 371, 501, 627, 640	<b>Fungicides</b>	87, 119-120, 133-134, 159, 312, 403, 584, 603, 606, 655, 659, 710, 716		
<b>Curing Agents</b>	16, 39, 66, 121, 219, 252, 385, 550, 567, 574, 584, 668, 686	<b>Herbicides</b>	43, 49, 150, 237, 342, 347, 513, 518, 709		
		<b>Humectants</b>	180, 196, 209, 604		



# commercial chemical materials

... made available in 1955

Chemical materials made available on a commercial scale<sup>†</sup> last year are described in this list.

An asterisk denotes products that manufacturer states were not available to industry prior to the time he introduced his product, or which had special characteristics not available before that time. Those not marked were previously available, but not from the company indicated.

If you would like additional information on any item, contact manufacturer. Full names and addresses are on page 82.

In looking for materials for specific uses, you'll find it more convenient to first see our "Use-Index," page 32, which is cross-indexed with this list. Find what you want there, then check this list for items with numbers below 500.

<sup>†</sup>Developmental-scale chemical materials are listed starting on page 64

1) **ACCOBOND 3900** — Bonding agent for coatings, printings to cellulose. Cationic syrup. Am Cy.

2) **ACCOSPERSE DISPERSIONS** — Series of highly deflocculated pigments for aq paint systems. As follows: Hansa Yellow G 46-4053; Toluidine Red XL 22-3053; Naphthol Scarlet 22-7513; Cyan Blue GT 56-3303; Cyan Blue B 56-3653; Cyan Green 16-9013; Pigment Green B 16-4013. Am Cy.

3) **\*ACETONE** — Spectroscopically pure grade for spectrophotometry and chromatography. Bottles bear facsimile of actual 220-360 mμ curve for lot. BP: 56.5°. Toxicity: 500 ppm max allowable. Fisher Sci.

3A) **\*ACETONEDICARBOXYLIC ACID** — 99%. MP. 135°. A chelating, leavening agent; intermed. for pharmaceuticals, disinfectants, insecticides, dyestuffs. Pfizer.

3B) **\*ACETYL TRI-2-ETHYLHEXYLCITRATE** — Citroflex A-8 has 95+% purity, low volatility and toxicity. BP (1 mm): 225°. Plasticizer with PVC resins, stabilizer for polyvinylidene chloride. Has low volatility. Pfizer.

4) **ACIDIC WOOD PRODUCTS AND LIGNIN MIXTURES** — In purification and refining of animal, vegetable, and hydrogenated fats and oils. Politol S is an alkaline grade used in primary degumming and alkali refining; Politol N is an acidic grade for finishing. Non-toxic. W.Va. Pulp & Paper.

5) **\*ACRYLATE ELASTOMER** — For packings, gaskets. Fabrics impregnant. Resists ozone, solvents. Non-swelling. Monsanto.

6) **\*ACRYLIC POLYMER** — Water-soluble. Goodrite CB-35 core sand binder has low gas formation, easy knockout, storage stability. Goodrich Chem.

7) **ACRYLIC POLYMER** — Cyanamer 370. Thickener, stabilizer for latices. Flocculating, dispersing agent. 95% active. Am Cy.

8) **ACTIVATED CARBON** — G-32 is solvent recovery grade, coconut shell base. Girdler.

9) **ADENOSINE TRIPHOSPHATE, CRYSTALLINE DISODIUM** — Over 99% pure, for biochemical research, pharmaceutical manufacture. Schwarz.

10) **ADHESIVE**—Honeycomb Adhesive No. 55 provides a strong bond between core materials such as aluminum, paper, minerals, wood, under proper curing conditions. Federal Adhesives.

11) **ADHESIVE** — Adhesive 54A is a white, fluid, resin emulsion for binding paper, paperboard, leather, or cloth to metallics, porcelain, or glass. It is fast setting, non-toxic, water- and heat-resistant. Federal Adhesives.

12) **ADHESIVE** — Boilproof Adhesive B4A, a liquid synthetic resin emulsion, does not require catalyst. For bonding wood, paperboard, textiles to porcelain, steel, or glass. Fast setting, non-toxic, water-resistant, long shelf life. Federal Adhesives.

13) **ADIPIC ACID** — Pure intermediate. Nat'l Aniline.

14) **ADVAMIX ZL** — Wetting and dispersing aid in many paint formulations. Advance.

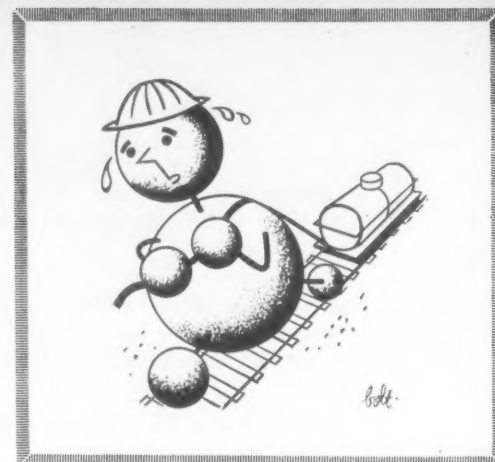
15) **AEROSOL 22** — Emulsifier, soaps, cleaners. Demulsifier, inks, deflocculation. Am Cy.

16) **\*AEROTEX ACCELERATORS** — Catalyst for silicone water repellents. Easily dispersed. Am Cy.

17) **\*AEROTEX RESIN 803** — Stiffening for all fibers. Exceptional stability. Am Cy.

18) **\*AEROTEX RESIN MW** — Modified melamine-formaldehyde. Resists chlorine yellowing, loss of strength in cotton fabric finish. Am Cy.

19) **AEROTEX RESIN UM** — Melamine-formaldehyde, for crease-resistance, cotton, rayon. White, free-flowing powder. Durability. Am Cy.



20) **AEROTEX SYRUP 55** — Modified urea-formaldehyde resin. Stiffens rayon, cotton. Am Cy.

21) **\*AEROTEX THICKENER 37** — Additive for warp sizes, rubber latices. Non-hygroscopic. Am Cy.

22) **AEROTEX WATER REPELLENT S** — Emulsion for water-repellent finish on fibers. Excellent running properties. Am Cy.

23) **ALAMASK PRODUCTS** — These synthetic aromatics and allied materials are used in pulp sulfate process, petroleum refining as odor control chemicals in processes and fume wastes. Rhodia.

24) **ALIPHATIC POLYMERS** — Long chain aliphatic polymers with disulfide links and reactive terminals are basis for adhesive formulations for metals, ceramics, wood, leather, and rubber. In combination with liquid epoxy resin, amine catalyst, and inert filler, the polymers form adhesives having good peel, bend, impact strength, permanent flex, high shear, and improved wetting properties. Thiokol.

25) **ALIZAROL VERDON S** — Non-dusting chrome dye for wool, light fast. Blue-green. Nat'l Aniline.

26) **\*ALKENYL SUCCINIC ACID** — Partially neutralized, Bavon® 66, a proprietary composition, imparts water resistance to leather and allied materials, while retaining moisture absorbent flesh side and good moisture vapor permeability. Koppers.

27) **\*ALKYD RESIN** — Used in paints, inks to control viscosity and flow. Alkydol Labs.

28) **ALKYD VEHICLE** — Called FANY, vehicle is for quick-dry enamels, semi-glosses, exterior trim, and house paints. 70% N.V. Vis: Z3-Z5. Has quick, hard dry and excellent flex. Farnow.

29) **\*ALKYL ADIPATE ESTER COMPLEX, MIXED** — Primary plasticizer for PVC, NL F-33 pours at 1.7°. Low-temp flex, low volatility and viscosity. Nat'l Lead.

30) **\*ALKYL ADIPATE, MIXED** — Primary plasticizer for PVC plastics. NL F-32 has -34° pour point, good low-temp flex, low volatility. Nat'l Lead.

31) **ALKYL ARYL PHTHALATE** — Cabflex® HS-10 is a highly compatible monomeric plasticizer having high stability and permanence. Especially good for high temp vinyl insulation compounds. Boiling range (@ 4 mm): 262-288°. MP: < -40°. Cabot.

32) **ALKYL POLYETHOXYETHANOL BENZYLAMMONIUM CHLORIDE** — 75+% active. Katapone VV-328 is water-sol cationic surface-active agent with acid corrosion inhibiting, bactericidal prop. Gen. Aniline.



33) **ALKYLAMINE ALKYL ARYL SULFONATE** — Ninate 411 has a mw about 400, emulsifies or clearly dissolves petroleum solvents with water. Ninol.

34) **\*ALKYLATED BENZENE** — Conoco H-300 is secondary plasticizer for PVC resins. Has good color, excellent heat, light stability, improved low-temp flex. MP: -40°F. BP: 600-740°F. Cont'l Oil.

35) **ALKYL-BENZYL TRIETHYL AMMONIUM CHLORIDES** — Isomeric mixture is called Emcol E-11. Surface-active for deodorizing, sanitizing, slime control, or cationic wetting action. Emulsol.

36) **ALKYLKETENE DIMER** — Aquapel is a chemical compound which reacts with cellulose fibers to form a water-, acid-, alkali-resistant surface. Hercules.

37) **ALLYLUREA** — For modification of urea-formaldehyde resins, and as copolymer to alter flexibility. 99% pure, MP is 83-85°. Exp. Eastern.

38) **ALUMINA, CALCINED** — R-2003 has 99.1% purity. Bayer-Sinter process gives 95%  $\alpha$ , 5 % essentially  $\gamma$ . Has minimum of chemically combined water, adsorbs only trace quantities of water. Low distortion, high thermal and mechanical shock resistance, readily grindable to 10 $\mu$  size. Uses: abrasives, refractories, glass, polishing and buffing compounds, lab ware, grinding balls. Reynolds Metals.

39) **AMINE COMPLEX OF BORON TRIFLUORIDE** — Epon Curing Agent BF3-400 for epoxies used for dipping and impregnating applications where long pot life is required. Also for adhesives and in structural uses. Regulation of cure is easy. Cured products have superior chemical and heat resistance. Shell.

40) **AMINO CARBOXYLIC ACIDS SALTS** — Chee-lox B-14 is a balanced mixture of the soluble salts, 41% active. All purpose stable sequestering agent for Ca<sup>++</sup> and Mg<sup>++</sup> along with iron. Gen. Aniline.

41) **\*AMINO COMPOUND** — Avasol 112P improves dyeing, dye fixing, destaticizes, softens synthetics. Comes 100% or as 30% paste. Non-yellowing. Alframine.

42) **\*AMINO-ALCOHOLS** — Electrosols D and M. For mold release, destaticizing, upping resiliency, clarity, and printing of polyethylene. Dec. 350°. MP: 8-18°. Non-toxic. Alframine.

43) **\*3-AMINO-1,2,4-TRIAZOLE** — Two products are available: Weedazol for translocating and killing many broadleaf perennial weeds, and Meeno for cotton defoliation and inhibition of regrowth. Purities: 95%. LD<sub>50</sub>: 14.7 gm/kg. Am. Chem. Paint.

44) **AMMONIA** — High purity anhydrous ammonia. Columbia-Southern.

45) **AMMONIA** — High purity anhydrous ammonia for wood pulp processes, water treatment, agricultural uses. Toxicity: ICC Green Label. Pennsalt of Wash.

46) **AMMONIUM LAURYL SULFATE** — Aqueous, 27-30% conc. Maprox NH for non-alkaline shampoos, related products. Stable. Onyx.

(Please turn to next page)

Unless otherwise specified . . .

Pressures are in mm of mercury (abs.)

Boiling points are at 760 mm

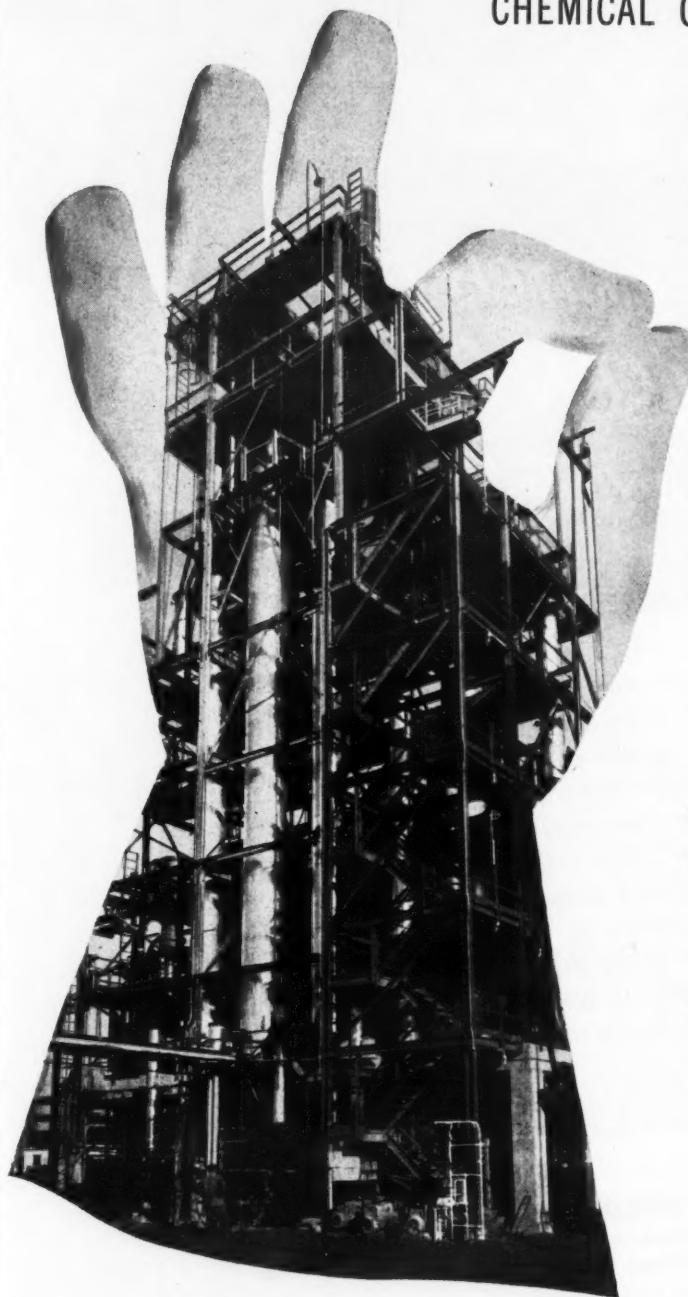
Temperatures are in °C

Solubilities are at room temperature

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# THE SWITCH IS TO... DAVISON SILICA GEL FOR DRYING NATURAL GAS

Actual use tests have proven to many that Davison Silica Gel is the efficient, economical way to dry natural gas.

Davison Silica Gel gives you a high capacity for moisture even at elevated temperatures (110-120°F.). It is economical to use because it requires fewer reactivations and gives longer life due to its resistance to fouling and attrition. Davison Silica Gel dries a wide variety of gas feeds to extremely low dew points. It is one of the most efficient adsorbents known for hydrocarbon recovery.

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Progress Through Chemistry

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Division of W. R. Grace & Co.  
Baltimore 3, Maryland

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Producers of: Catalysts, Inorganic Acids, Superphosphates, Triple Superphosphates, Phosphate Rock, Silica Gels and Silicofluorides. Sole producers of DAVCO® Granulated Fertilizers.



## MATERIALS

### new commercial chemicals 47-79

(Continued from preceding page)

47) **AMMONIUM PERCHLORATE** — 99.5%. Smokeless oxidizing agent. Am. Potash & Chem.

48) **\*AMMONIUM POLYACRYLATE SOLN., MODIFIED** — Hycryl A-1000 is a pigment dispersing medium for tannery finishes, emulsion paints, latex compounding. Has water resistance. Union Bay State.

49) **\*AMMONIUM SULFAMATE** — Ammate-X Weed and Brush Killer has 95% conc. Can be used as spray safely on brush adjacent to crops sensitive to hormone brush killers. DuPont Grasselli.

50) **AMYLTRICHLOROSILANE** — 97%  $C_6H_5SiCl_3$  BP: 167°. Silicone intermed. Toxic. Dow Corning.

51) **\*ANILINE** — Water white product, unusually high purity from new manufacturing process. Nat'l Aniline.

52) **ANTIMONY OXIDE** — pigment type KR is used in paints and plastics as a pigment and fire retarding agent. Non-reactive, excellent whiteness, used with  $TiO_2$  or  $ZnO$  or both. Harshaw.

53) **ANTIOXIDANT 425** — In rubber. Non-staining, for white or light color formulations. Am Cy.

54) **\*ANTIOXIDANT D** — Antiskinning agent for finishes, pigment dispersions, spray coatings. Will not effect drying time, easily mixed. Nat'l Aniline.

55) **\*ARCTURUS RED** — Brilliant orange red shade, very transparent, resists bleeding. For inks, plastics, rubber. Sher.-Wms.

56) **ATMULS** — Mono and diglycerides of fat-forming fatty acids with < 0.01% each of butylated hydroxy toluene, butylated hydroxy anisole, and citric acid in propylene glycol added as preservatives. Emulsifiers for plastics and foods. Atmul 80 is 40-44%  $\alpha$  monoglyceride, MP: 122-125°, iodine value: 55-60. Atmul 122 is 52-56%  $\alpha$  monoglyceride, MP: 125-127°, iodine value: 45-55. Both are ivory-white, vated, plastic solids. Atlas Food Ind. Div.

57) **BARIUM-CADMIUM COMPOUNDS** — For heat and light stabilization of PVC. Advastabs 23-74 and X23-30. Advance.

58) **\*BARIUM-CADMIUM ORGANIC COMPLEX** — Provinite is good heat and light stabilizer for clear PVC. Resists plate-out, low viscosity build-up in dispersion resin systems. Two part. Nat'l Lead.

59) **BARIUM CARBONATE** — 99.4%. For optical glass, prevention of bloom in brick and tile, lube and sealant in oil well drilling, clarifying agent for beet sugars, filler for paper, linoleum, rubber, and paint. Low Fe and S. Sher.-Wms.

60) **BENZIDINE YELLOW** — 12219. Brilliant greenish tone, max transparency. Printing inks. Sher.-Wms.

61) **\*BENZIDINE YELLOW** — Lightfast. 12222 is med. shade, of great strength, good light resistance. For inks, plastics, rubber, paint. Sher.-Wms.

62) **BENZIDINE YELLOWS** — Lightfast. Lemon yellow, grease and light resistant. 12220 is transparent; 12221 is opaque. For inks, paint, rubber, plastics, floor coverings. Sher.-Wms.

63) **4-BENZOYLPIRIDINE** — 98+%. Freezes: 69.7° min. Intermediate for phenyl-4-pyridyl carbinols. Reilly.

64) **\*BENZYL ETHYLENE GLYCOL** — 99%. Intermediate for perfume ingredients. Millmaster.

When inquiring check CP 4614 opposite last page



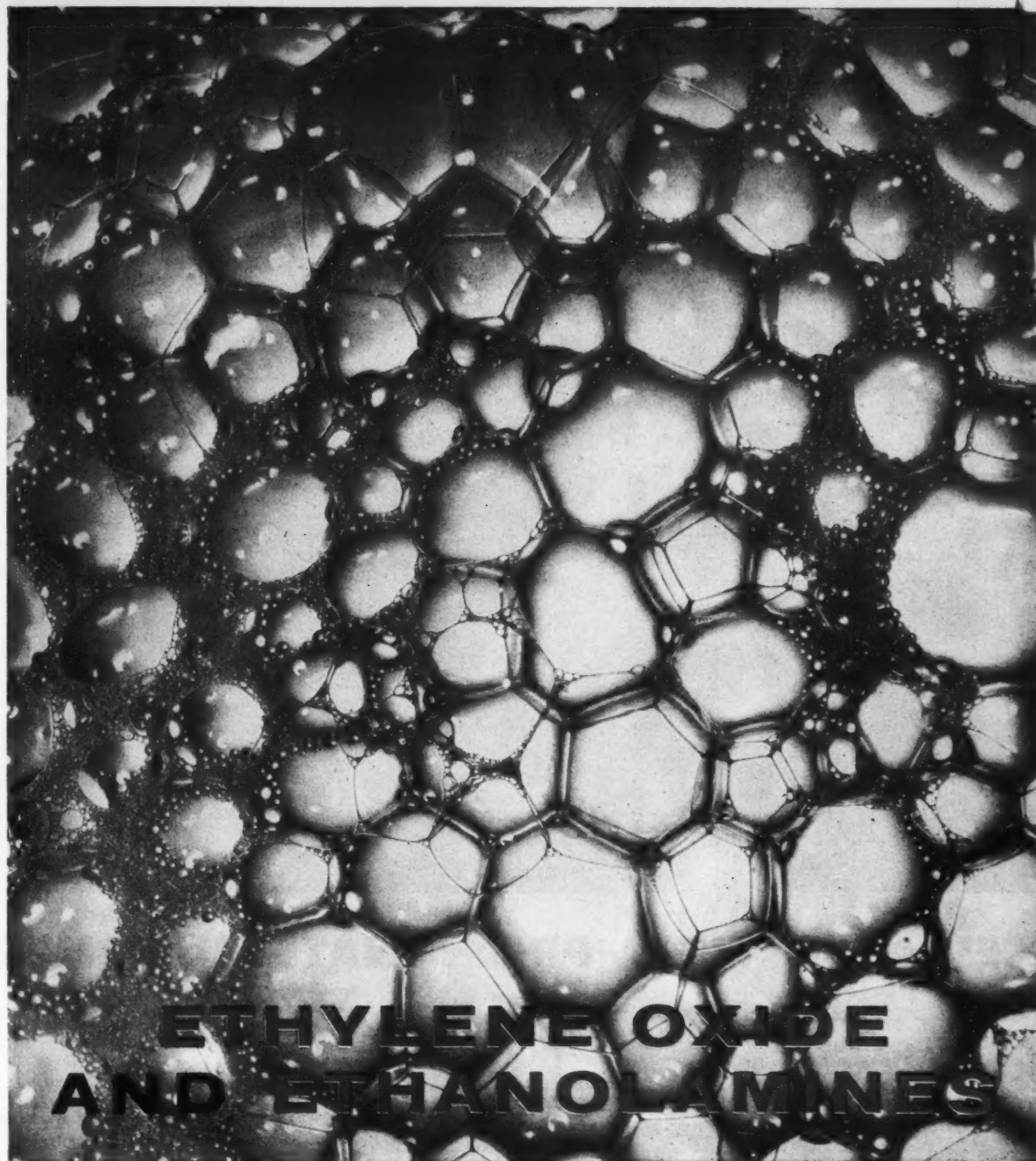
## MATERIALS

- 65) **\*BENZYL ETHYLENE OXIDE** — 99%. Stabilizer for chlorinated hydrocarbons and active diluent for epoxy resins. BP: 70° @ 2 mm. Millmaster.
- 66) **N-BENZYL TRIMETHYL AMMONIUM METH-OXIDE** — Catalyst in organic reactions and in basic curing of resins. Compound is an organic-soluble strong base. 40% quaternary assay in methanol. Sumner.
- 67) **BENZYLAMINE** — Intermediate for quaternary compounds and in organic synthesis. Min purity: 98%. Boiling range: 182-185°. Sumner.
- 68) **N-BENZYLDIMETHYLAMINE** — Intermediate and as an organic base. Min purity: 97%. Sumner.
- 69) **N-BENZYLMETHYLAMINE** — Intermediate. Min purity: 97%. Boiling range: 182-188°. Sumner.
- 70) **BETAINE HYDROIODIDE** — Iodamine is white, odorless crystals. Source of internal iodine, and preservative. MP: 243-245°. Chemo Puro.
- 71) **BLACK K SALT** — Stabilized diazonium salt for black on cotton, viscose rayon. Nat'l Aniline.
- 72) **BORIC ACID ESTERS** — Eleven organic boric acid esters. Boroester 10: tri-(diisobutylcarbonyl) borate. Boroester 11: tri-n-propyl or triisopropyl borate. Boroester 12: tri-(methylisobutylcarbonyl) borate. Boroester 13: triethyl borate. Boroester 14: trioleyl borate. Boroester 16: tri-(1-ethynylcyclohexyl) borate. Boroester 17: tri-(2-phenylcyclohexyl) borate. Boroester 18: triphenyl borate. Boroester 19: tri-o-chlorophenyl borate. Boroester 20: tri-ethanolamine borate. Boroester 21: triisopropanolamine borate. Pacific Coast Borax.
- 73) **\*BORON, AMORPHOUS** — 90-92%. As intermediate. Am. Potash & Chem.
- 74) **\*BORON, AMORPHOUS** — Two high purity grades offered. Intermediate. Pacific Coast Borax.
- 75) **BRIGHTENERS** — Advabrite M-10 liquid and Brightener MDAC (4-methyl-7-diethylamino coumarin) give bright blue-white fluorescence in very dilute soln. Plastic uses. Advance.
- 76) **BUTADIENE POLYMER** — Pliolite Latex 2104 for latex foam sponge. A "cold" latex, essentially odorless. Goodyear Chem. Div.
- 77) **BUTADIENE-ACRYLONITRILE COPOLYMERS** — Chemigum Latex 236 and 246 have small particle size and excellent mechanical stability. Uses: leather finishes, textile inks, beater impregnation of paper. Goodyear Chem. Div.
- 78) **BUTADIENE-ACRYLONITRILE ELASTOMERS** — Chemigums N6 and N7 are oil-resistant medium acrylonitrile rubbers. Goodyear Chem. Div.
- 79) **BUTADIENE-STYRENE COPOLYMER** — Plioflex Rubber 1502 is a "cold" rubber polymer containing antioxidants. Uses: light or colored products such as white wall tires, MRG. Goodyear Chem. Div.

(Please turn to page 39)

THE QUICK WAY to pin-point a chemical material for a specific application is to use the "Use-Index" on page 32.

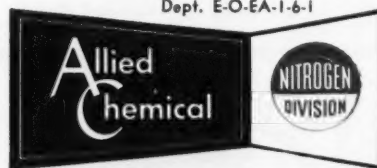
MANUFACTURER ADDRESS LIST starts on page 82. Contact them for additional details.



## ETHYLENE OXIDE AND ETHANOLAMINES

Need ethylene oxide or mono-, di-, or triethanolamine? Allied's Orange, Texas plant—most modern in the industry—can supply you with oxide and amines consistently above standard specifications. Shipments available in tank cars, tank trucks or 55-gallon drums from the plant. Amines also available for delivery in tank trucks and 55-gallon drums from nationwide stock points. Write for samples, quotations, literature, technical service with no obligation.

Dept. E-O-EA-1-6-1

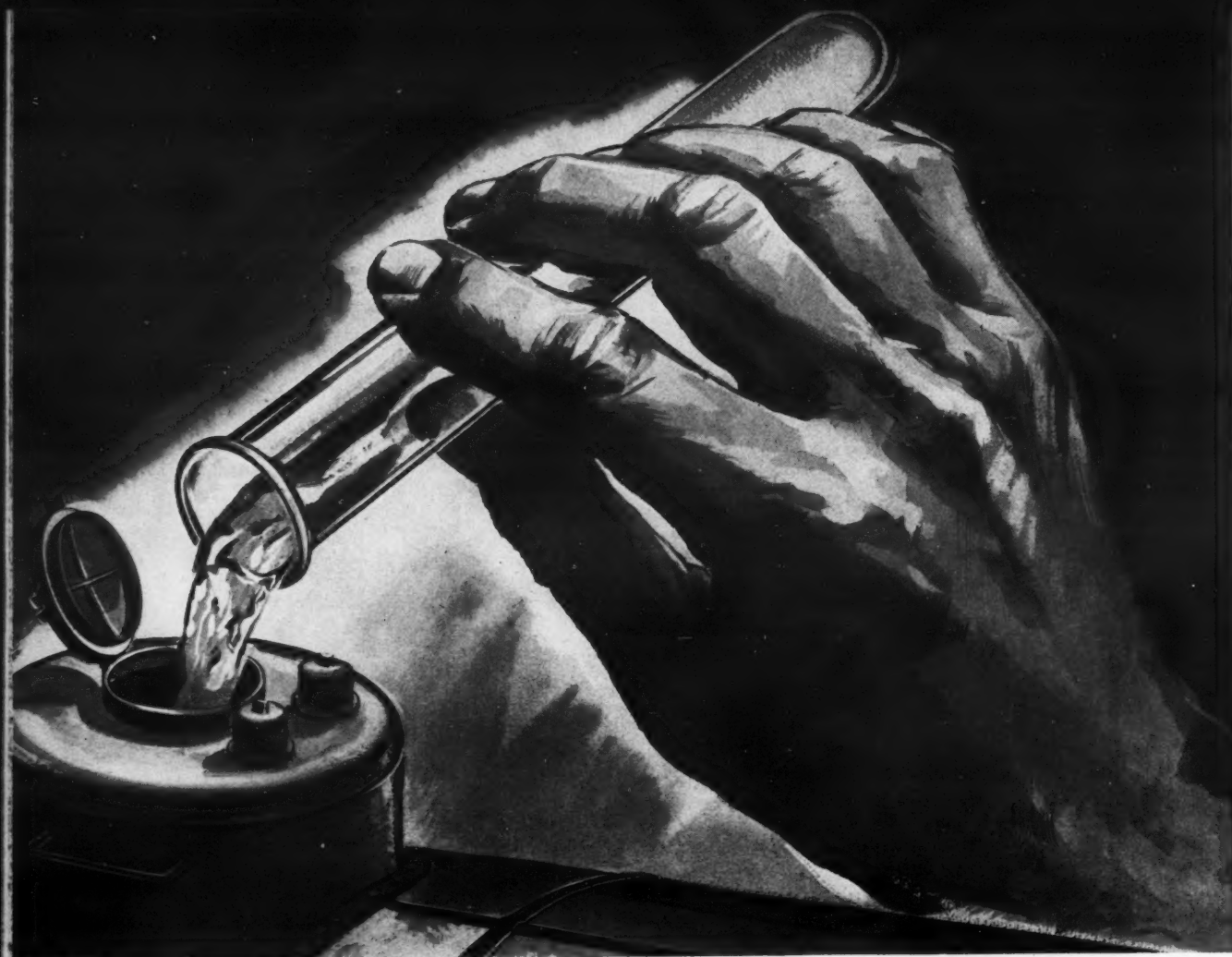


40 Rector Street, New York 6, N. Y.

Ethanolamines • Ethylene Oxide • Ethylene Glycols • Urea • Formaldehyde • U. F. Concentrate — 85 • Anhydrous Ammonia • Ammonia Liquor • Ammonium Sulfate • Sodium Nitrate • Methanol • Nitrogen Solutions • Nitrogen Tetroxide • Fertilizers & Feed Supplements

When inquiring check CP 4615 opposite last page





## CELANESE\* VINYL PROPIONATE MONOMER *goes "tankcar!"*

**Full scale production of new monomer provides new source for homopolymers and copolymers with distinctive product-improving properties**

Celanese Vinyl Propionate Monomer in volume clears the way for the commercial development of new emulsion paints, adhesives, laminates, plastics, synthetic rubbers, protective coatings and finishes.

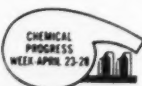
Like Vinyl Acetate—first of the Celanese Vinyl Monomers—Vinyl Propionate copolymerizes with acrylics, maleics, styrene, butadiene, and most other vinyl monomers. It promises new product values for many fields.

You can get prompt delivery of Celanese Vinyl Propionate in drum lots to tankcar quantities. For samples and technical bulletin, write:

Celanese Corporation of America, Chemical Division, Dept. 591-D, 180 Madison Avenue, New York 16.

### DESCRIPTIVE DATA

Distillation Range @ 760 mm, °C.....	Within 6° spread Including 94.9
Color APHA, max.....	30
Aldehydes as acetaldehyde, % wt., max....	0.05
Water, % wt., max.....	0.25
Specific Gravity @ 20°/20°C.....	0.9160-0.9185



\*Reg. U. S. Pat. Off.



### MATERIALS

**No toxic effects with these two epoxies . . .**

laminating, surface coat resins have good physicals

**Uses:** One resin is for laminating, the other is for surface coating.

**Features:** Toxic effects are reduced or eliminated. It is unlikely that they will produce allergic reactions. Physicals are good, as described below.

**Description:** Laminating resin #607 has high fiber laminating bond strength when combined with company's #20 accelerator resin. It has low viscosity and thoroughly wets fiber. Laminates have chemical resistance, low shrink, and dimensional stability.

Resin #604 is used as a gel coat on molds and models to keep glass fibers from showing through. It's a heavy consistency liquid that spreads evenly and won't run off on vertical surfaces.

(Epoxy resins are products of Marblette Corp., Dept. CP, 37-21 Thirtieth St., Long Island City 1, N.Y. . . . or for more information check CP 4616 on form opposite last page.)

### Adsorption aluminas for chromatography

Processed and standardized specifically for chromatographic use, a series of standardized acid, basic, and neutral analytical-grade adsorption aluminas are available. These have an activity of grade I (Brockmann).

(Adsorption aluminas are product of Bio-Rad Laboratories, Dept. CP, 800 Delaware St., Berkeley, Calif. . . . or for more information check CP 4617 on form which is located opposite last page.)



For more information on product at left, specify CP 4618 . . . see information request blank opposite last page.

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APRIL

**new commercial chemicals**  
**80-93**

(Continued from page 37)

80) **BUTADIENE-STYRENE COPOLYMER** — Pliolite Latex 2105 is a "cold" latex, especially resistant to staining and discoloration. For foam sponge, textile sizes, adhesives. Goodyear Chem. Div.

81) **BUTADIENE-STYRENE COPOLYMERS** — Plioflex Rubbers 1703 and 1710 are "oil-extended," for tires, molded, extruded goods. 1703 contains Wing Stay S antioxidants to resist staining for use in colorful products. Goodyear Chem. Div.

82) **BUTADIENE-STYRENE COPOLYMERS** — Pliolite Latex 2101 and X765 are "cold" latices which can be compounded, processed, and cured for general purpose applications. They can also be used for dipping tire cord. Goodyear Chem. Div.

83) **\*p-BUTOXYPHENOL** — 93+%. MP: 61-65°. Intermed. for unsymmetrical ethers of hydroquinone. Abbott.

84) **2-tert-BUTYLANTHRAQUINONE** — 98+%. Intermediate. Min MP: 101.5° Gen. Aniline.

85) **CADMIUM SULFATE, ANHYDROUS** — Reagent for research in industrial phosphors and analysis of organic pesticides. Insol matter < 0.005%. Chloride < 0.001%. Toxic. Fisher Sci.

86) **\*CALCIUM ALKYL ARYL SULFONATE** — 50% soln in oil, Ninat 402 is used in blends with nonionic surface-active agents to make emulsifiers for special systems. It imparts spontaneity of emulsification. Ninol.

87) **CALCIUM AND SODIUM PROPIONATES** — Propiobans are fungicides for foods, and ophthalmological antibacterials. Odorless powders. Chemo Puro.

88) **CALCIUM CARBONATE, STANDARDIZED** — A primary standard for flame photometry and Versene chelating agent titrations. Mallinckrodt.

88A) **CALCIUM CYCLAMATE** — 98+%. Noncaloric approved sweetening agent for foods and drugs. Pfizer.

89) **CALCIUM PHYTATE** — Argo brand is acid-soluble, water-insol. Complexing agent removes traces of iron from acid solns. Corn Prod.

90) **CALCIUM SILICATE, SYNTHETIC** — Micro-Cel has high adsorbency, low bulk density, small particle size, inertness. Is good bulking, anticaking agent and adsorbent. Johns-Manville.

91) **CALCIUM STEARATE** — Aq dispersion. Witco Paste #253 improves processing properties and characteristics of coatings for machine coated papers. Witco.

92) **\*CALCOFLUOR WHITE RWS** — Optical bleach for wool, nylon, acetate, Water sol. Am Cy.

93) **\*CALCOLOID BLACK DBL** — Direct, vat dye paste. Black. Am Cy.

(Please turn to next page)

Unless otherwise specified . . .

Pressures are in mm of mercury (abs.)  
Boiling points are at 760 mm  
Temperatures are in °C  
Solubilities are at room temperature

When inquiring check CP 4619 opposite last page

- ★ 100% petroleum polymer
- ★ Versatile, compatible, permanent
- ★ By the trainload, if you wish

The extremely low cost of PICCOPALE, and its availability in enormous quantities make this new type of petroleum resin ideal for use as a basic raw material. It is chemically inert—not affected by acids, and alkalis; moisture-proof; compatible; soluble in naphthas, chlorinated and other solvents. Available in liquid solution or in flaked or solid form.

WRITE for complete data, specifications and samples.

PENNSYLVANIA INDUSTRIAL CHEMICAL CORP. (CP)  
Clairton, Penna.

Please send me a copy of your bulletin describing PICCOPALE and samples of grade for (application)

Name \_\_\_\_\_ Position \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_

**Pennsylvania Industrial Chemical Corp.**  
Clairton, Pennsylvania

Plants at:  
Clairton, Pa.; West Elizabeth, Pa.; and Chester, Pa.  
District Sales Offices:  
Boston, New York, Detroit, Chicago, Cincinnati,  
Los Angeles, Philadelphia, Pittsburgh

**Increase your Efficiency!**  
**ALVIN LEAD HOLDER and LEAD POINTER**  
... precision designed for you!

**ALVIN MECHANICAL LEAD HOLDERS**  
● Sure-grip mechanism prevents lead from slipping or turning ● Push-button, coil spring action quickly adjusts lead to desired length  
● Perfectly balanced, featherweight barrel of hard rubber . . . fits hand comfortably for effortless drawing ● Modern design in jet black finish and precision made of quality materials for trouble-free service. **\$1.35 with clip. \$1.25 without clip.**

**PARAMOUNT Drawing Leads in 18 degrees-7B to 9H. \$.75 per tube of 12 leads.**

**ALVIN PRECISION LEAD POINTER**  
● Easy-to-operate. Few easy turns quickly sharpens any standard size lead to precise point desired ● Retains graphite dust ● Keeps hands clean  
● Fool-proof construction assures years of efficient service. **\$1.75**

**ALVIN**  
see your local dealer or order by number . . . TODAY  
**ALVIN & COMPANY**  
Windsor 1, Conn.  
When inquiring check CP 4620 opposite last page

Send for **FREE** 60 page CATALOG

**you need MOLYKOTE® Lubricants**

**IF YOU HAVE LUBRICATION PROBLEMS IN THESE APPLICATIONS**

**CHECK OFF THE ONES WHICH ARE GIVING YOU TROUBLE**

<input type="checkbox"/> EXTREME BEARING PRESSURES	<input type="checkbox"/> FRETTING
<input type="checkbox"/> EXTREME TEMPERATURES	<input type="checkbox"/> HIGH STARTING FRICTION
<input type="checkbox"/> UNUSUAL ENVIRONMENT	<input type="checkbox"/> RUBBER ON METAL
<input type="checkbox"/> MATING SURFACES OF SAME OR SIMILAR MATERIALS	<input type="checkbox"/> LIFETIME LUBRICATION
	<input type="checkbox"/> RESISTANCE TO CENTRIFUGAL FORCE

Even if you have checked only one of these sources of lubrication problems, you need MOLYKOTE. Tell us which ones you have checked and we will mail you pertinent literature.

**The ALPHA MOLYKOTE Corporation**  
Main Facilities: 67 Harvard Avenue, Stamford, Conn.  
71 Arnulfstrasse, Munich 19, Germany

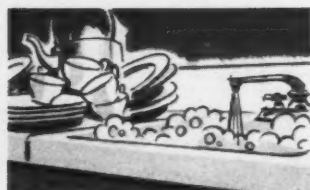
When inquiring check CP 4621 opposite last page



# THESE SUNOCO PETROCHEMICALS CAN HELP YOU GET HIGH-QUALITY END PRODUCTS



POLYURETHANE FOAMS



DETERGENTS



PAINT, VARNISH, LACQUER



CORROSION INHIBITORS



SYNTHETIC FABRICS

## BENZENE

**Thiophene-free** benzene means less expensive processing. Sunoco Benzene is guaranteed Nitration Grade with a minimum freezing point of 5.2 C and a high mol % purity.

## TOLUENE

**Mol % purity of 99.9** assures greater yields. Sunoco Toluene is paraffin- and thiophene-free.

## XYLENE

**Lower than usual acid-wash color** gives higher product quality.

## PROPYLENE TRIMER

**Consistent uniformity** eliminates color problems in end products. Low sulfur. Narrow distillation range.

## SUNAPTIC ACIDS

**High molecular weight**, low unsaponifiables and no olefinic unsaturation allow possible substitution for fatty, naphthenic and synthetic acids. Very efficient in corrosion inhibitors.

## PDO-40 (Petroleum Drying Oil)

**Excellent film-forming ability** of this high-grade petroleum resin makes it highly resistant to water, alkalis and dilute acids.

## SULFONATE WS

**Low in cost**, this water-soluble sulfonate has a wide variety of uses as a wetting agent, re-wetting agent, air entrainer and frother.

## SULFUR

**New from Sun!!** This bright molten sulfur is currently available only in bulk in areas near Marcus Hook, Pa.

## ANHYDROUS AMMONIA

**New from Sun!!** Refrigeration and commercial grades available in tank cars only from Sun's refinery in Marcus Hook, Pa.

For complete information see your Sun Representative. Or write for free technical bulletins to Sun Oil Company, Philadelphia 3, Pa. Dept. CP-4.



INDUSTRIAL PRODUCTS DEPARTMENT  
**SUN OIL COMPANY**  
PHILADELPHIA 3, PA.

IN CANADA: SUN OIL COMPANY, LTD., TORONTO AND MONTREAL

When inquiring check CP 4622 opposite last page

## MATERIALS

### new commercial chemicals 94-128

(Continued from preceding page)

94) \*CALCOLOID FAST YELLOW — Light fast. Powder for vat dyeing, paste for printing. Am Cy.

95) \*CALCOSOL PRINTING PINK 5BP — Paste for nylon, acetate. Am Cy.

96) CALCOSOL YELLOW PG — Double paste for vat dyeing. Am Cy.

97) CALCOTONE BLUE GWO — Paste for pigment printing, water-in-oil systems. Am Cy.

98) CALCOTONE YELLOW GWO — Paste. Pigment printing, water-in-oil systems. Am Cy.

99) e-CAPROLACTAM — Stabilizer, plasticizer for plastics. Versatile intermediate. Nat'l Aniline.

100) CAPRYLENE — 90-95%. BP: 123°. MP: -104°. Solvent, intermediate. Wal-Tiernan Harchem.

101) CARBANTHRENE BLACK BROWN VA PASTE — Blackish brown anthraquinone vat dye. Light fast. Cotton, rayon. Nat'l Aniline.

102) CARBANTHRENE NAVY BLUE G DOUBLE PASTE — Vat dye for cotton, rayon. Greenish-navy blue. Anthraquinone based. Fast to water spotting. Nat'l Aniline.

103) CARBANTHRENE PRINTING BLACK BBD DOUBLE PASTE — Jet black for cotton, rayon. Light fast, anthraplinone based, non-drying. Nat'l Aniline.

104) \*N-CARBETHOXYPIPERAZINE — 97+%. To make unsymmetrical piperazine derivatives. Carbethoxy group removed by acid or base hydrolysis. Abbott.

105) CARBOHYDRATE POLYMERS, SYNTHETIC — Argo Polyoses have high clarity, stability, compatibility. Four viscosity grades come as powders. Uses: replacements for tapioca dextrans and gum arabic in adhesives, viscosity stabilization of dextrans and starches, adhesive ingredients, and extenders for more expensive water-soluble adhesives. Corn Prod.

106) CARBON BLACK-ALKYD DISPERSION — Black Shield #1955. An all-purpose dispersion for paints. Carbon Dispersions.

107) \*CARBON TETRACHLORIDE — Spectroscopically pure grade for spectrophotometry and chromatography. Bottles bear facsimile of actual 220-360 mμ curve for lot. BP: 76.7°. Toxicity: Acute (25 ppm). Fisher Sci.

107A) trans-β-CAROTENE — Comes as pure crystals or 24% suspension in vegetable oils. A source of vitamin A, and a color for foods. Pfizer.

108) CASEIN, FOAMLESS — Casein FF-30 is free of both internal and surface foam, produces higher gloss and shows better leveling and varnishability than standard high quality paper coatings. Prevents pits, pinholes, fish-eyes. Borden Chem. Div.

109) \*CHANNEL BLACK — Aroflo long flow black for heat set, offset, moisture set inks. Black has low oil absorption, low viscosity, and low cost. Disperses fast, easily. Huber.

110) CHLORINATED BIPHENYL — Plastichlor. Low priced fire retardant plasticizer. Aceto.

111) CHLORINATED PARAFFINS — Light colored and non-toxic products impart flame resistance to rubber stocks. Chlorowax 70 is a resinous modifier with all types of elastomers, is also a reinforcing agent and



## MATERIALS

plasticizer. Chlorowax 40 is a low volatile liquid plasticizer for neoprene and other rubbers. Diamond Alkali.

112) \*p-CHLOROBENZHYDROL — 95+%. Prep. of p-chlorobenzhydryl derivatives. Abbott.

113) p-CHLOROBENZOPHENONE — 93+%. Intermediate. MP: 73-78°. Abbott.

114) \*CHLOROFORM — Spectroscopically pure grade for spectrophotometry and chromatography. Bottles bear facsimile of actual 220-360 mμ curve for lot. BP: 61-62°. Toxicity: 100 ppm. Fisher Sci.

115) \*1-CHLORO-3-PHENYL-2-PROPANOL — 99%. Has reactive chlorine. Makes pharmaceuticals, biocides, biocidal synergists. BP: @ 2 mm: 113°. Millmaster.

115A) CHLOROTRIFLUOROETHYLENE — Kel-F® No. 90 Grease has low toxicity, resists strong acids, ozone, halogens. For lubricants. Kellogg.

116) p-CHLORO-m-XYLENOL — Chloroxylenol is external germicide, preservative. Chemo Puro.

117) COBALT-MOLYBDENUM CATALYST — 3.5% CoO, 10.5% MoO<sub>3</sub> on Al<sub>2</sub>O<sub>3</sub> support for hydrodesulfurization processes in refineries and coke oven plants. Has high activity, ruggedness, regeneration ability. Girdler.

118) \*COPPER DIHYDRAZINIUM SULFATE — Omazene controls foliage diseases of roses. LD<sub>50</sub>: 590 mg/kg. Olin Mathieson.

119) COPPER UNDECYLENATE — Cuprate powder has fungicidal properties. Chemo Puro.

120) m-CRESYL ACETATE — BP: 210-212°. Antiseptic and fungistatic properties. Chemo Puro.

121) CURING AGENT — Agent Z is a liquid curing agent for epoxy resins. Useful where chemical resistance, high heat distortion point, good electrical properties under high humidities are desired. Shell.

122) CYAN BLUE TONERS — Industrial lacquers, enamels. BNF 55-3750 clean red toned blue; GT NF 55-3450 bright blue. Stable in organics. Am Cy.

123) \*CYANATEX 3082 — Softener for polyvinyl acetate. Gives high luster to cotton. Am Cy.

124) \*CYANATEX 3105 — Rewetting agent, sanforizing assistant. Am Cy.

125) \*CYANATEX 3119 — Non-ionic softener for cotton, synthetic fibers. Am Cy.

126) \*CYANATEX SB 100 — Softener for yarns. Am Cy.

127) CYCLOHEXANE — Spectroscopically pure grade for spectrophotometry and chromatography. Bottles bear facsimile of actual 220-360 mμ curve for lot. BP: 80.7°. Fisher Sci.

128) CYCLOHEXANONE — Solvent has good penetrating properties, non-toxic, high solvency for resins, dyestuffs. Purity 99%. Nat'l Aniline.

(Please turn to next page)

THE QUICK WAY to pin-point a chemical material for a specific application is to use the "Use-Index" on page 32.

MANUFACTURER ADDRESS LIST starts on page 82. Contact them for additional details.

## Here's proof

ALCOA Alumina doubles  
— even triples — the life of  
ceramic mill liners



BEFORE TEST

AFTER TEST

BEFORE TEST

AFTER TEST

Standard porcelain block

Arlcite block containing  
ALCOA ALUMINA

▼ The first and third blocks from the left, shown above, were used to line a mill in which accelerated grinding tests were conducted. The same blocks, after test, are beside the originals. Note how abrasive action in grinding has seriously worn away the standard porcelain, yet has had little effect on the Arlcite block. Arlcite, manufactured by The Patterson Foundry & Machine Company, East Liverpool, Ohio, is a high density ceramic, the principal ingredient of which is ALCOA Alumina.

As the pioneer commercial producer of high density mill linings, lifter bars and grinding media, Patterson recognized the value of ALCOA Alumina in ceramics when production was started in 1938. Its extraordinary toughness and abrasion resistance made it a natural choice for Arlcite.

Arlcite high-alumina ceramic will outwear porcelain linings 2½ to 3 times, thus reducing contamination of product, frequent relinings and costly downtime. Moreover, grinding tests conducted with extra-abrasive vitreous enamel showed a reduction in grinding time of 40 to 60 per cent, with

negligible losses in mill linings and grinding media. This resistance to abrasion and impact has prompted Patterson to develop disintegrator blades and other new products with ALCOA Alumina.

ALCOA does not make ceramic products. But more and more leading manufacturers are adding ALCOA Alumina to their mixes to improve the performance of their products. We will gladly send you complete information and samples. Write to ALUMINUM COMPANY OF AMERICA, CHEMICALS DIVISION, 705-D Alcoa Building, Pittsburgh 19, Pa.



When inquiring check CP 4623 opposite last page



## Everybody's doing it . . . with aluminum

Strategic industrial material, aluminum has a bright future in the rapidly expanding do-it-yourself market. Every day, new uses are found for this versatile metal that account for increased demand for soda ash, caustic soda, and sulphuric acid . . . chemicals essential to aluminum production.

To anticipate and provide for the growing chemical requirements of the aluminum industry, Olin Mathieson has a forward-looking program of *coordinated planning and production*. This assures aluminum producers of the availability of chemical raw materials regardless of changing market conditions or

added requirements for plant expansions.

At present, a growing number of chemical consumers are coordinating their planning and production with Olin Mathieson . . . America's prime producer of basic industrial chemicals. Olin Mathieson's long experience and familiarity with the broad market picture can prove invaluable in *your* planning. Why not consult with us . . . now?

3334

### MATHIESON CHEMICALS

OLIN MATHIESON CHEMICAL CORPORATION  
INDUSTRIAL CHEMICALS DIVISION • BALTIMORE 3, MD.



**INORGANIC CHEMICALS:** Ammonia • Bicarbonate of Soda • Carbon Dioxide • Caustic Potash • Caustic Soda • Chlorine • Hydrazine and Derivatives • Hypochlorite Products • Muriatic Acid • Nitrate of Soda • Nitric Acid • Soda Ash • Sodium Chlorite Products • Sulphate of Alumina • Sulphur (Processed) • Sulphuric Acid  
**ORGANIC CHEMICALS:** Ethylene Oxide • Ethylene Glycols • Polyethylene Glycols • Glycol Ether Solvents • Ethylene Dichloride • Dichloroethylene • Formaldehyde • Methanol • Sodium Methylate • Hexamine • Ethylene Diamine • Polyamines • Ethanolamines • Trichlorobenzene • Polychlorobenzene • Trichlorophenol

When inquiring check CP 4624 opposite last page

## MATERIALS

### new commercial chemicals 129-166

(Continued from preceding page)

129) **L-CYSTEINE ETHYL ESTER • HCl** — For biochemical research. Schwarz.

130) **DECYL ALCOHOLS** — Mixture of primary alcohols. BP: 217.3°. Makes plasticizers, diester lubes for jet aircraft. Carbide & Carbon.

131) **\*DECYL ESTERS, MIXED** — Plasticizer D-31 for PVC upholstery and outerwear. Rubber Corp.

132) **\*DEFOAMERS** — Defoamers F 42 and 45 are fluid, non-sludging, effective for yeast and fermentation. Pour points: 60°F. Swift.

133) **DEHYDROACETIC ACID** — Dydrac powder is insol: water; sol: acetone, benzene. Fungicide. Chemo Puro.

134) **DEHYDROACETIC ACID** — MP: 109.5°. Bacteria and fungi growth inhibitor. Toxicity: low. Aceto.

135) **DEOXYADENOSINE** — Chromatographically pure for biochemical research. Schwarz.

136) **DEOXYCYTIDINE DEOXYCHLORIDE** — Chromatographically pure for biochemical use. Schwarz.

137) **DEOXYGUANOSINE** — Chromatographically pure for biochemical research. Schwarz.

138) **DEOXYURIDINE** — Chromatographically pure for biochemical research. Schwarz.

139) **\*DI-ALLYL PHTHALATE PREPOLYMER** — Dapon® Resin for laminating, molding, resin blends. Excellent electrical properties, low shrinkage, insol after polymerization, moisture resistant. Ohio-Apex.

140) **2,4-DIAMINODIPHENYLAMINE** — 95+ % pure. Rubber additive, hair dye component, moisture barrier for Se rectifiers. Air stable. Fine Organics.

141) **DIASTATIC ENZYME** — Rhozyme GC is liquid desizing agent for textiles. High activity. Rohm & Haas Textile Chem. Dept.

142) **\*DIAZINON** — Very outstanding residual fly control chemical; is being used successfully in fly baits. BP: 83-84° @ 0.002 mm for pure product. Sl. sol water. Dissolves in petroleum solvents, alcohol, xylene, acetone. Geigy.

143) **N,N-DIBENZYLAMINE** — Intermediate for quaternary compounds and organics. 95+ % pure. Sumner.

144) **N,N-DIBENZYLMETHYLAMINE** — Intermediate. May find use as an oil-soluble rust inhibitor as it blocks corrosive activity of acids produced by oxidations. A liquid, it has min purity of 95%. Sumner.

145) **DIBROMODIMETHYL HYDANTOIN** — Active Br content of about 54%. Brominating agent for most organics. Powder is easy to use. Glyco.

146) **DIBUTYL FUMARATE** — Comonomer for PVAc emulsions, polyester resins. Reactive plasticizing monomer. Monsanto.

147) **DI-BUTYL FUMARATE** — Comonomer in polymerizations. DBF is 99% pure. Internal plasticizer. Rubber Corp.

148) **DIBUTYL MALEATE** — Comonomer DBM for polymerization reactions for coatings. Purity: 99%. Is an internal plasticizer. Rubber Corp.

149) **DICALCIUM FRUCTOSE-1,6-DIPHOSPHATE** — Tech. For biochemical, pharmaceutical use. Schwarz.

150) \*DICHLORAL UREA — Called Crag DCU, it is a 73%-active wettable powder. For control (2-3 months) of germinating annual grasses. Non-corrosive, has a min of toxicological hazards. Carbide & Carbon.

151) 2,5-DICHLOROANILINE — 99+%. Dyestuff intermediate. Gen. Aniline.

152) DICUMYL PEROXIDE — Di-Cup vulcanizes rubber by carbon-to-carbon linking, producing sulfur-free stocks. Good for colored stocks. Hercules.

153) N,N'-DICYCLOHEXYLCARBODIIMIDE — Versatile reagent in biochemical research. Schwarz.

154) DIDECYL ADIPATE — Flexol 10-A is non-volatile plasticizer for vinyl chloride resin. Superior low-temp prop, non-volatile. Carbide & Carbon.

155) DIDECYL PHTHALATE — Flexol 10-10 is primary plasticizer for vinyl chloride resins, esp. electrical insulation compounds. Heat, light stable; very low volatility. BP (5 mm): 261°. Improved low-temp properties. Carbide & Carbon.

156) DIETHANOLAMINE — Production of resins, pharmaceuticals, air purification. Nitrogen-Allied.

157) 1,2-DIETHOXY ETHANE — Called Ether 222, its purity is 99+%, MP: -74°, and BP: 121.4°. It is a solvent for printing inks and dyestuffs, and a general reaction solvent. Ansul.

158) \*2-DIETHYLAMINOETHANOL — As an emulsifier in floor waxes and as a corrosion inhibitor. Intermediate for ion exchange resins, lube oil additives. Tech. Low cost. Sharples.

159) DIETHYLAMMONIUM SALICYLATE — Damsal is vapor phase fungistat and rust inhibitor. Chemo Puro.

160) \*DI-2-ETHYLHEXYL AZELATE — As base for synthetic fluids and greases, Emolein 2958 Lubricant Ester has outstanding viscosity-temp properties, is stable to oxidation, has high VI. Emery Ind.

161) DI-ISO-DECYL ADIPATE — 99% DIDA. Good low-temp plasticizer for PVC. Rubber Corp.

162) DI-ISO-DECYL ADIPATE — Elastex 20-A Plasticizer has good low-temp performance, low volatility. Barrett.

163) DI-ISO-DECYL PHTHALATE — 99% DIDP. Plasticizer for PVC. Rubber Corp.

164) DI-ISO-DECYL PHTHALATE — Elastix 90-P Plasticizer has low volatility, resists thermal degradation. Barrett.

165) DI-ISO-DECYL PHTHALATE — Plasticizer NL A-40 for PVC. Low volatility, superior electrical properties. Freezes @ -34°. Nat'l Lead.

166) DI-ISO-DECYL PHTHALATE, MODIFIED — 99% ester. DIDP-10 plasticizes PVC wire coverings. Rubber Corp.

(Please turn to next page)

Unless otherwise specified . . .

Pressures are in mm of mercury (abs.)

Boiling points are at 760 mm

Temperatures are in °C

Solubilities are at room temperature

interior  
vinyl  
paints...



## Now! Stronger and tougher paint films! —with National's new Resyn® 12K-55

RESYN 12K-55 is new. But the copolymer is unchanged. It's the same inherently flexible Resyn 12K that's gained wide recognition among paint makers. The improvement is in the balanced emulsifier system. Particles are smaller. Flow together more readily. Form stronger, tougher films.

RESYN 12K-55 offers still further advantages:

- Uniform color over surfaces of varying porosity
- Improved compatibility with tube color systems
- Excellent color development
- Easy brushing and leveling properties
- Improved stain removal characteristics
- Simpler formulation
- Freeze-thaw stability
- Low temperature film formation
- Borax compatibility
- Lower viscosity
- Prolonged aging stability
- Low residual monomer content

RESYN 12K-55 can be used as a base for interior—and exterior—vinyl paints and primers. Let one of National's Vinyl Specialists explain Resyn 12K-55 more fully. Just write or call your nearest National office.

RESIN DIVISION

**National**

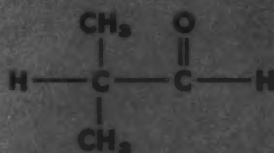
STARCH PRODUCTS INC.



National Starch Products Inc., 270 Madison Avenue, New York 16, N. Y. • Plainfield, N. J. • Chicago • Los Angeles • San Francisco • Cleveland • St. Louis • Atlanta • Canada: Toronto • Montreal • Vancouver • Mexico City: Polimeros, S. A., Apartado 28504, Mexico 17, D. F.

When inquiring check CP 4625 opposite last page





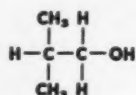
Isobutyraldehyde

Specifications	Technical Grade	C. P. Grade
Color, A.P.H.A. (platinum-cobalt standard)	10 p.p.m. max.	10 p.p.m. max.
Specific Gravity, 20°/20°C.	0.789-0.799	0.786-0.790
Isobutyraldehyde by distillation	95.5% min.	
Turbidity (fuller's earth standard)		1 A.P.H.A. unit max.
Isobutyraldehyde by titration	95.5% min.	97% min.
Boiling Range		95% between 62°-67°C.
Water	3.0% max.	0.5% max.
Acidity, as isobutyric acid	0.35% max.	0.35% max.
Ash	0.0015% max.	0.0013%

# isobutyraldehyde

... a versatile building block

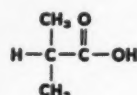
## Commercially Available Derivatives



### isobutyl alcohol

Reduction product of isobutyraldehyde

Color, A.P.H.A.	5 p.p.m. Max.
(platinum-cobalt standard)	
Specific Gravity, 20°/20°C.	0.80210-0.80444
Assay, by weight	99.0% Min.
Nonvolatile	0.005 gram per 100 ml. sample min.
Acidity, as acetic acid	0.005% Max.
Water	0.2% Max.
Boiling Range	
Initial	106.0°C.
Dry	109.0°C.
Carbonyl	0.07% Max.

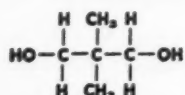


### isobutyric acid

Oxidation product of isobutyraldehyde

Color, A.P.H.A.	10 p.p.m. Max.
(platinum-cobalt standard)	
Specific Gravity, 20°/20°C.	0.946-0.951
Assay	99.0% Min.
Water	0.10% Max.
Reducing Substances	3.0 ml. 0.1 N KMnO <sub>4</sub> per 2 ml. sample min.
Boiling Range	
Initial	150°C.
Dry	157°C.

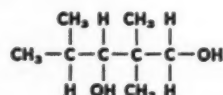
## Available Pilot Plant Derivatives



### neopentyl glycol

Reduced condensation product of isobutyraldehyde and formaldehyde

Form	Crystalline solid
Color	White
Melting Point	124°-130°C.
Purity	96% minimum



### 2,2,4-trimethyl-1,3-pentanediol

Reduced condensation product of isobutyraldehyde

Form	Crystalline solid
Color	White
Melting Point	49°-51°C.
Purity	95% minimum

Eastman isobutyraldehyde is a new commercially available chemical building block supplied in both C. P. and technical grades. C. P. isobutyraldehyde, an essentially anhydrous material, is primarily intended for use in the manufacture of fine chemicals such as pharmaceuticals. It is available in carload drum quantities. The technical grade of isobutyraldehyde is intended for applications where extremely high purity is not essential. This grade is available in tank car quantities.

Produced by the oxonation of propylene, this versatile aldehyde can be used to produce many interesting chemicals. Among the derivatives already available in commercial quantities are isobutyl alcohol and isobutyric acid. Neopentyl glycol and 2,2,4-trimethyl-1,3-pentanediol are presently available in pilot plant quantities and are expected to be in commercial production during 1956. These isobutyraldehyde derivatives are useful in themselves or as starting materials in the production of solvents, plasticizers, pharmaceuticals, polymer intermediates, resins, insecticides, hydraulic fluids and lubricants.

If you are interested in isobutyraldehyde itself, or in any of the available derivatives we will be glad to send you samples so that you may evaluate their possible place in your production picture.

**Eastman**  
CHEMICAL PRODUCTS, INC.  
KINGSPORT, TENNESSEE  
subsidiary of EASTMAN KODAK COMPANY

SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tenn.; New York, N. Y.; Framingham, Mass.; Cincinnati; Cleveland; Chicago; St. Louis; Houston. West Coast: Wilson Meyer Co., San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.

When inquiring check CP 4626 opposite last page

## MATERIALS

### new commercial chemicals 167-197

(Continued from preceding page)

167) \*DIISOPROPYL SEBACATE — A solvent plasticizer for low temp properties in vinyl and cellulose resins. Color: water white. Odor: low. Purity: 99%. BP @ 50 mm: 220°. Kessler.

168) \*DIMETHYL SILOXANE — F 4290 is hammer finish additive for organic finishes. Effective with many resin vehicles in very low conc. Dow Corning.

169) 2-DIMETHYLAMINOETHANOL — As an emulsifier in floor waxes and as a corrosion inhibitor. It is an intermediate for ion exchange resins and lube oil additives. Tech. Sharples.

170) 3,4-DIMETHYLPHENOL — Intermediate for making resins, fireproofing agents, aromatic chemicals, pharmaceuticals. 98% 'pure. MP: 62-65°. Eastern.

171) \*DIMYRISTOYL-L-α-LECITHIN — Synthetic crystals. Replace natural lecithins in antigen mixtures for serodiagnosis of syphilis. Stable. LaMotte.

172) DINONYLPHENOL — Hydroxyl No. 145-165. Intermed: surface-actives, dyes, antioxidants. Gen. Aniline.

173) \*DIOCTYL SODIUM SULFOSUCCINATE, MODIFIED — Monawet FS-2 combines effective wetting and penetration properties. Non-toxic. Mona Ind.

174) DIPHENYLAMINE — Stabilizer for explosives. Intermediate, dyestuffs, rubber antioxidants. Am Cy.

175) \*DIVINYLMER — Monomer MG-1 is a polymerizable dispersant for vinyl chloride resins to give plastics of desired degree of hardness or flexibility from plastisols. Monomer polymerizes during fusion. Carbide & Carbon.

176) \*ELDEFOAM 400 — Clear, light-colored liquid is defoamer for polyvinyl acetate latex paints. Freezes: -6°. Boiling range (@ 2.5 mm): 180-260°. Foremost Food & Chem.

177) EMULSIFIER — Emulsifier P enables pine oil to give a stable emulsion in aq solns. Mona Ind.

178) \*ESTERFLEX B-1 — A compatible, high solvation stabilizer. Pours: 30°F. Swift.

179) ETHER, STABILIZED — Anhydrous Ether AR contains 0.05 ppm of sodium diethyldithiocarbamate to inhibit aldehyde, peroxide formation. Mallinckrodt.

179A) \*ETHYL BIXIN — Suspension in vegetable oil. Non-toxic, stable, vegetable color for foods and drugs. Pfizer.

180) ETHYL GLUCOSIDE — Non-crystalline, viscous syrup consisting of mixed α and β isomers. Contains about 80% solids. Its hygroscopic properties make it a useful conditioning agent, humectant, plasticizer. Intermediate for surface-active agents. Corn Prod.

181) ETHYL HYDROXYETHYL CELLULOSE — EHEC is a water-resisting, film-forming polymer with a wide range of solubilities. For varnishes, lacquers, inks, and to control floating of pigments in finishes. Higher melting than ethyl cellulose. Hercules.

182) \*2-ETHYL ISOHEXANOL — Makes many excellent plasticizers. BP: 173.0-180.0°. Eastman C.P.

183) 2-ETHYLANTHRAQUINONE — 98+%. Chemical and dyestuff intermediate. Gen. Aniline.

184) ETHYLMERCAPTAN — 99% (wt) pure. BP: 34.4°. Intermediate for systemic insecticides. Sharples.

185) **FATTY ACID AMIDES** — Monamid 150 series comes in eight grades, all have high amide content. Uses: foam builders and stabilizers, detergency boosters when added to other detergents. Mona Ind.

186) **\*FATTY ACID DIETHANOLAMIDES** — Super-Amides L9, GR, and GC have 90, 80, 75% conc. For cosmetics, household cleaners, textile detergents, foam stabilizers, dyeing, emulsifying. Onyx.

187) **\*FATTY ALCOHOL COMPOUND** — Agent 31-11 is an anti-settling agent for paint and varnish. Very small quantities are required. Faltek Prod.

188) **FATTY ALCOHOLS** — High mw saturated or unsaturated fatty alcohols have very high purities, constant chemical analysis and iodine value. Made by sodium reduction syntheses, new series of Unadols and Adols will find major use as chemical intermediates where their desirable properties can be imparted to many products. Archer-Daniels-Midland.

189) **\*FATTY AMIDE, SUBSTITUTED** — Appramine 355 is 35% active. Cationic textile softener and finish. Compat: urea-formaldehyde resins, silicones. Warwick.

190) **\*FATTY AMINE CONDENSATE** — Sulfanole ANS gives stability of foam characteristics of cosmetics and shampoos. 97.0% active. Warwick.

191) **\*FERRIC DIETHYLENTRIAMINE PENTA-ACETATE** — Sequestrene® 330 Fe Iron Chelate corrects chlorosis due to Fe deficiency in plants growing in alkaline or slightly acid soil. Geigy.

192) **FERRIC ORTHO PHOSPHATE** — 28-30% Fe. For iron enrichment of vitamins. Passes all requirements of Federal and state laws. Turner.

192A) **FLUOROCARBON LACQUER RESIN** — Kel-F® 800 for protective coatings, lacquer, thermoplastic resin. MP: 220° F. Toxicity: nil at use temp. Kellogg.

192B) **FLUOROCARBON RUBBER** — Kel-F® Elastomer can be blended with common rubbers. Withstands continued exposure at 400°F, has excellent chemical resistance. Low toxicity. Kellogg.

193) **FLUOROCHEMICAL SIZE** — Kraft paper sizing agent Scotchgard imparts excellent resistance to oily and greasy materials. Strength, porosity, flexibility, appearance, or color is not affected. Can be used with existing equipment. Minn. Mining.

194) **\*FREEZE-THAW STABILIZERS** — RD-1888 and RD-1272-R impart freeze-thaw stability to high styrene-butadiene paint latex, with no effect on scrubability of finished paint. Armour Chem. Div.

195) **\*FUELGUARD** — Inhibits and disperses gum and sludge in fuel oils. Controls corrosion in presence of water. Ashless. Pours <-35°F. API: 24.2°. Oil sol. Carlisle Chem.

196) **GLYCERINE** — BP: 290°. Dow.

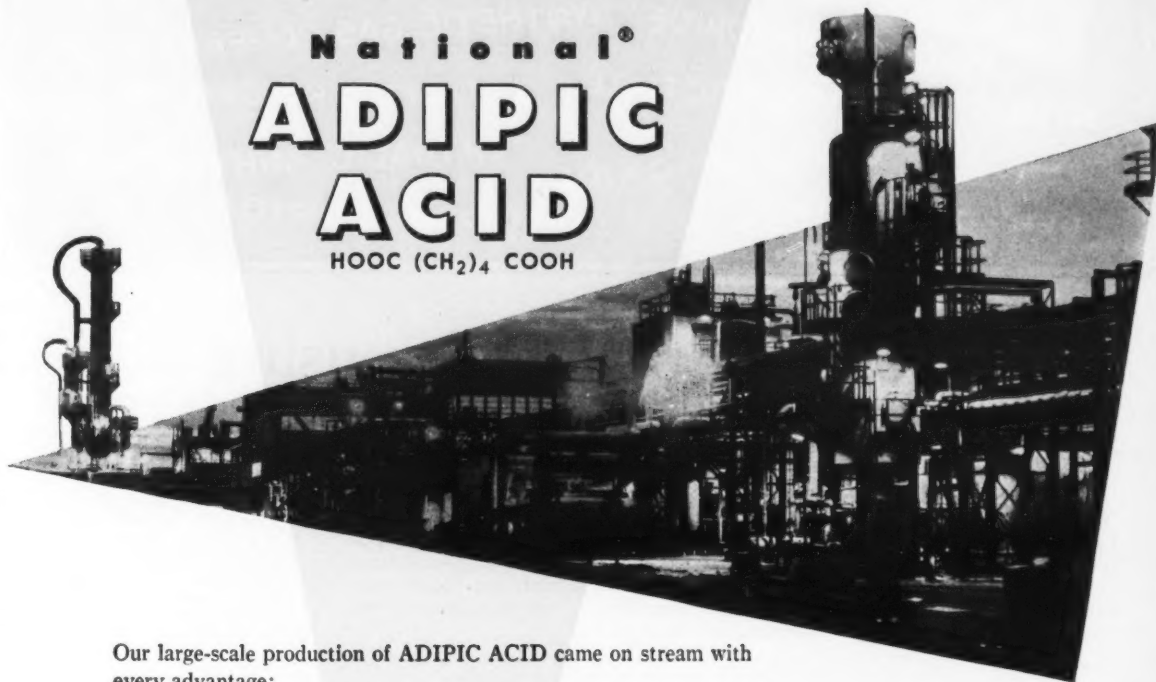
197) **GLYCEROL MONOSTEARATES** — Non-self-  
(Please turn to next page)

THE QUICK WAY to pin-point a chemical material for a specific application is to use the "Use-Index" on page 32.

MANUFACTURER ADDRESS LIST starts on page 82. Contact them for additional details.

# Sets a new high standard of quality

National®  
**ADIPIC  
ACID**  
HOOC (CH<sub>2</sub>)<sub>4</sub> COOH



Our large-scale production of ADIPIC ACID came on stream with every advantage:

A brand new plant Allied Chemical-integrated right back to basic raw materials.

An efficient, continuous process yielding an outstandingly high quality product—99.7% minimum purity, light color and low iron.

If you make or contemplate making adipates, adipic polyesters or polyurethans, you should investigate the advantages of National ADIPIC ACID. It can be used with complete satisfaction in the rubber, plastics, plasticizer, lube oil and chemical industries. We will be glad to send samples, technical data and quotations.

## SEND FOR TECHNICAL BULLETIN I-12

This comprehensive 8-page technical bulletin on National Adipic Acid gives physical and chemical properties; principal reactions of the carboxyl and alpha methylene groups; solubility curve, and suggested uses with copious literature references.

**NATIONAL ANILINE DIVISION**  
**ALLIED CHEMICAL & DYE CORPORATION**  
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When inquiring check CP 4627 opposite last page

If your  
processing  
involves:

GRATES or SUSPENDING BEDS  
PROTECTIVE ATMOSPHERES  
DESSICANTS  
MALEIC ANHYDRIDE SYNTHETIC GAS GENERATION  
NITRIC ACID MANUFACTURE CATALYTIC REFORMING  
ETHYLENE OXIDE PHTHALIC ANHYDRIDE  
DEHYDRATION DEHYDROGENATION

## You can benefit by using ALUNDUM\* catalyst carriers

More and more chemical engineers are finding in Norton ALUNDUM catalyst carriers the R's they need for faster, better, lower cost production in a wide range of processing.

These fused alumina carriers are characterized by excellent mechanical, thermal and chemical stability. They have high resistance to abrasion and erosion,

and their low density is useful for packing and filling applications. Catalytically, they are crystalline in nature and are produced in two surface area types: low and intermediate. Intermediate surface area carriers are subdivided into types A, B, and C, with varying characteristics.

TYPICAL CHEMICAL ANALYSES (%)			PHYSICAL PROPERTIES						
	LOW SURFACE AREA	INTERMEDIATE SURFACE AREA		Porosity	Water Absorption	Bulk Density	Vol. Bulk Density	Crystal Structure	Surface Area
Al <sub>2</sub> O <sub>3</sub>	89.4-76.6	77.0	Low Surface Area	40-50%	20-25%	1.90-2.10 gr/cc	65-80 lbs/ft <sup>3</sup>	Alpha Alumina	Less than 1m <sup>2</sup> /gram
SiO <sub>2</sub>	9.3-16.8	21.2	Intermediate Surface Area Type A	50-55%	28-30%	1.65-1.70 gr/cc	58 lbs/ft <sup>3</sup> (app)	Alpha, Gamma Alumina-chiefly Gamma	60-70m <sup>2</sup> /gram
Fe <sub>2</sub> O <sub>3</sub>	0.5-1.3	0.2	Type B	50-55%	28-30%	1.65-1.70 gr/cc	60 lbs/ft <sup>3</sup> (app)	Quartz, Alpha, Kappa, Delta Alumina-chiefly Quartz	20-30m <sup>2</sup> /gram
MgO	0.1-0.6	0.4							
CaO	0.1-0.8	0.5							
Na <sub>2</sub> O	0.3-0.4	0.2	Type C	50-55%	28-30%	1.65-1.70 gr/cc	62 lbs/ft <sup>3</sup> (app)	Alpha Alumina and Mullite	5-10m <sup>2</sup> /gram
K <sub>2</sub> O	0.1-1.0	0.5							
TiO <sub>2</sub>	0.2-2.5	0.2							

### Shapes and Sizes

Spheres: (Low surface area) 3/16"-1" diam; (Intermediate surface area) 1/4"-1/2" diam. Pellets: (All carriers) 1/8" x 1/8"-1/2" x 1/2". Rings: (All carriers) 1/8" x 1/4" x 3/8" O.D.-1" x 1 1/2" x 1 1/2" O.D.

### Typical Applications

Low Surface Area Carriers: phthalic anhydride, maleic anhydride, ethylene oxide, protective atmospheres, synthetic gas generation, grates or suspending beds for active catalysts.

Intermediate Surface Area Carriers:

catalytic reforming, dehydrogenation, dehydration, sulfuric acid manufacture, nitric acid manufacture, dessicants.

### Get More Facts

on how Norton ALUNDUM catalyst carriers are engineered and prescribed to give you the most effective combination of physical, thermal, chemical and electrical properties. Learn how they can improve and economize your processing. Call in your Norton Refractories Engineer, or write, mentioning your specific requirements, to NORTON COMPANY, 563 New Bond St., Worcester

6, Mass. Canadian Representative: A. P. Green Fire Brick Co., Ltd., Toronto, Canada.

**NORTON**  
REFRACTORIES  
Engineered... R... Prescribed  
Making better products...  
to make your products better

\*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

When inquiring check CP 4628 opposite last page

## MATERIALS

new commercial chemicals  
198-207

(Continued from preceding page)

emulsifying, Arlacel 161 has 40-44% monoglyceride content; Arlacel 169 has 61-66%. Exceptional batch-to-batch uniformity. MP's 59-61° and 60-62°, respectively. For cosmetic and pharmaceutical usage. Atlas Chem Div.

198) \*GRAPHITE IN WATER — Dag Dispersion No. 226 has 22% solids content. Its good conductivity, ease of application, and good adherence make it attractive as an electrically conductive coating. Acheson Colloids.

199) \*HARFLEX 300 — Permanent vinyl plasticizer. Highly compatible. Wal-Tiernan Harchem.

201) C-HEPTADECENYL N-HYDROXYETHYL IMIDAZOLINE — Onamine RO is oil-soluble emulsifier, penetrant and wetting agent for acid systems. Fixing, wetting, softening agent for leather. Onyx.

200) HEAT SEAL COATING — Arcco C 605 for glassine, Al foil, coated papers gives strong heat seal bond on wrappers, especially for food products. Has high gloss, is odor-free. Borden, Resinous-Reslac Dept.

202) 1,1,2,3,3,5-HEXAMETHYL INDAN METHYL KETONE — Phantolid creates an effect of luxury and costliness in moderately priced group of fragrances, at low cost. Waxy solid. Stable. Its fragrance resembles an odor compromise between artificial musks and natural musk. Polak's Frutal Works.

203) HIGHER ALKYPHENOXO POLYOXYETHYLENE ETHANOL — 99.5+% active. Igepal DM-710 is agri. chem. emulsifier, detergent for cellulosic and synthetic fibers. Nonionic. Gen. Aniline.

204) DL-HOMOCYSTEINE THIOLACTONE•HCl — For biochemical research. Schwarz.

205) DL-HOMOCYSTINE — For biochemical research. C<sub>6</sub>H<sub>16</sub>N<sub>2</sub>O<sub>4</sub>S<sub>2</sub>. Schwarz.

206) HYDROFLUOSILICIC ACID — 23% H<sub>2</sub>SiF<sub>6</sub> acid soln for fluoridation of water and industrial uses. Inter. Min.

207) HYDROGEN PEROXIDE CRYSTALS — 99.6% pure. SP "100" should open new vistas for peroxide applications. Becco.

(Please turn to page 47)





# U.S.I. CHEMICAL NEWS

Mar.-Apr.

★

A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries

★

1956

## Polyurethane Foams Claimed Exceptional For Lightweight Insulation

Can Be Made With  
"U.S.I. Isosebatic" Acid

The unique combination of desirable properties indicated for polyurethane foams has given rise to the prediction in some quarters that the market for these relatively new materials will increase in the next five years from a few hundred thousand pounds to one hundred million pounds annually.

Outdoor clothing manufacturers are already investigating the flexible foam varieties — cold-setting products formed by mixing a diisocyanate with a polyester resin — as a possibility for lightweight insulating materials. Here's why! Polyurethane foams, it is claimed, are long-lasting because they are tough, highly resistant to the deteriorating effects of temperature extremes (—40 to 300°F), rot, vermin, sun, air, salt water, detergents, solvents, dilute acids, oils, aromatic fuels, and other agents which might come in contact with clothing in outdoor use, cleaning, storage and shipping.

The warmth versus weight factor is outstanding. A  $\frac{1}{8}$ " interlining gives the warmth of a sheepskin coat at a fraction of the latter's weight and bulk. These foams are highly tear resistant, and can be sewn by hand or machine without fabric backing or covering. They are waterproof and fire retardant, and take dyes in any color from pastels to deep hues. If these claims are substantiated over a long term testing period, the U. S. Government would probably be a major customer for garments incorporating polyurethane flexible foams for the armed forces.

The new product "U.S.I. Isosebatic" acid shows good possibilities as a raw material in the formulation of the polyester resin used in the production of flexible polyurethane foams. "U.S.I. Isosebatic" acid is now in pilot plant production with a full-scale commercial unit scheduled to come onstream early in 1957.

## Methionine Shows Promise In Treatment of Falling Hair

The sulfur amino acid methionine may be an important factor in the prevention of baldness and treatment of falling hair. Clinicians report that a preparation containing a solubilized form of methionine (N-acetyl DL-Methionine) in combination with an estrogenic hormone diminishes the excessive loss of hair when applied topically. The high sulfur amino acid content of human hair suggested the possibilities of the methionine treatment.

## NEW ANHYDROUS ALCOHOL UNIT COMPLETED

New Installation At Tuscola, Illinois  
Believed To Be The World's Largest Unit

A new anhydrous ethyl alcohol unit has just been placed on stream at the expanding chemical center at Tuscola, Illinois. Probably the largest ever built, its production will supplement that of existing U.S.I. anhydrous alcohol units

### Method of Laying Endless Plastic Pipe Disclosed

A recently issued patent discloses a method of laying endless pipe, without joints, at a speed of several miles per hour. A plastic pipe extruder mounted on a tractor extrudes the pipe continuously as the tractor moves forward.

The use of plastics in the field of liquid transportation should be broadened by this new method of laying pipe. It will be particularly useful where rapid installation is desirable and extreme pressures are not required.

### New Tests Shed More Light On Ammonia Activity In Soils

Missouri scientists have advanced our knowledge of ammonia activity in the soil several more steps in recent months. In tests applying 100 pounds of anhydrous ammonia per acre of silt loam, they found that the nitrogen released made available by chemical reaction 47 pounds of additional phosphate and about four extra pounds of potash. These compounds were already in the soil but in forms not available to growing plants.

Effects of moisture content on ammonia retention were established in these tests. It was found that ammonia losses were very low when applications were made in soil at an optimum 15-18% moisture content. At a 3 inch depth, the loss was 1% in 36 hours. The workers also concluded that dry soils hold ammonia far better than extremely wet soils.

Finally it was confirmed that ammonia additions increase the alkalinity of soils, contrary to the belief in some areas that soils become more acid.

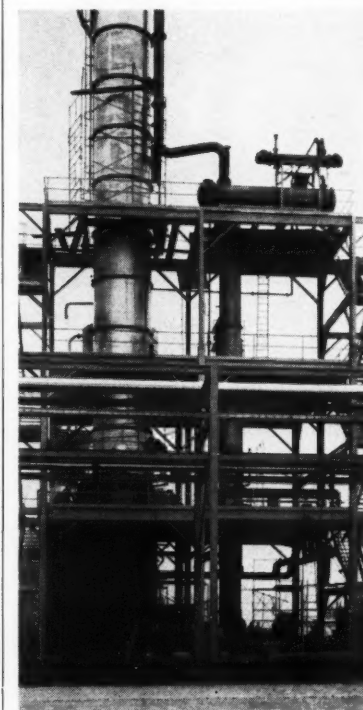
### You Can Receive U.S.I. Chemical News By Mail

You can be sure of seeing every issue of the U.S.I. Chemical News by writing, on your company letterhead, to the Editor, and requesting that your name be added to the U.S.I. Chemical News mailing list.

at Anaheim, California and New Orleans, Louisiana. The Tuscola site was chosen for this plant to permit integration with subsidiary National Petro-Chemicals Corporation's synthetic alcohol plant at this location.

Anhydrous alcohol from the three plants will be distributed from U.S.I.'s Tuscola, Chicago, Newark, Anaheim and New Orleans denaturing plants and from U.S.I. warehouse points throughout the country. It will be available as pure anhydrous alcohol, completely and specially denatured anhydrous alcohol and anhydrous SOLOX® and FILMEX®, two of U.S.I.'s proprietary denatured alcohol solvents.

U.S.I. built the world's first commercial anhydrous alcohol plant back in 1919, and the Company has since then maintained its position as the leader in that field.



New anhydrous alcohol unit

Mar.-Apr.

★

# U.S.I. CHEMICAL NEWS

★

1956

## New Book Answers Questions On Sodium Handling

Now available from U.S.I. is a revised, greatly expanded edition of the brochure, "Handling Metallic Sodium On A Plant Scale."

This is a comprehensive and completely up-to-date treatment of sodium handling technology, containing information such as details of typical sodium-using processes; details of equipment installation, insulation, etc.; recommendations for sodium pumping and instrumentation; recommendations for safety in design and operation.

A thorough engineering text, this book will be a valuable reference to anyone engaged in design or operation of a sodium handling process. The many diagrams, tables and photographs in the text will help the reader to visualize the operation of a well-designed sodium-using plant.

TABLE 1  
SIZES OF COMMERCIAL SODIUM


BRICK

Size (in.)	Weight (lb.)	Brick Dimensions (in.)	Barrel Dimensions (in.)
12 in.	120 lb.	12 x 12 x 12	12 x 12 x 12
8 in.	270 lb.	8 x 8 x 8	8 x 8 x 8
24 in.	420 lb.	24 x 24 x 24	24 x 24 x 24
1 in.	375 lb.	1 x 1 x 1	1 x 1 x 1

CAST SOLID

Size (in.)	Weight (lb.)	Brick Dimensions (in.)	Barrel Dimensions (in.)
12 in.	120 lb.	12 x 12 x 12	12 x 12 x 12
8 in.	270 lb.	8 x 8 x 8	8 x 8 x 8
24 in.	420 lb.	24 x 24 x 24	24 x 24 x 24
1 in.	375 lb.	1 x 1 x 1	1 x 1 x 1

40-ION TANK CAR



Sample page from U.S.I.'s new 40-page brochure, "Handling Metallic Sodium on a Plant Scale."

## Alcohol Users Can Measure Drum Contents By Stick With New U.S.I. Charts

Alcohol and solvent users can now obtain charts for determining the contents of 55-gallon drums at various temperatures by stick measurement from U.S.I.

The information was compiled from measurements of 190 and 200 proof alcohol in standard ICC-17E drums (35 inches by 24 inches). For other liquids in drums of the same dimensions, the quantities listed on the charts will be found approximately correct.

These charts will be found useful for general inventory purposes where it is desired to make approximate measurements with a minimum of effort. They are obtainable as 8½ x 11 catalog sheets and as 17 x 22 wall charts, from your local U.S.I. sales division or from the New York office of U.S.I.

## Urethan May Be Key To Safe Vaccination Against Newcastle Virus

Research at a Midwest experiment station on the effect of urethan on the multiplication of Newcastle disease virus suggests the possibility of producing a noninfectious vaccine against this disease in poultry.

A drawback of present commercial vaccine is that whole flocks may become infected following vaccination. Researchers found, however, that when urethan was used to attenuate the Newcastle virus it caused a complete loss of infectivity of the virus.

It is believed that the effectiveness of urethan may lie in its prevention of complete synthesis of the infectivity titer fraction of new Newcastle virus particles. By direct action on the protein material of the virus, urethan may inhibit further virus multiplication.

## TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

**Laboratory handling of radioactive materials** to insure safety is thoroughly outlined in a purchasable 41-page booklet prepared by the National Fire Protection Association's Committee on Atomic Energy. **No. 1140**

**Squeezeable polyethylene tubes for packaging** are now being coated internally to cut down permeation of oils and oxygen. Manufacturer believes tubes now suitable for 80% of products formerly unsatisfactory in polyethylene. **No. 1141**

**New textile fabric, of polyethylene** plus conventional yarns, is woven flat but becomes permanently 3-dimensional when dipped in boiling water. Process yields textures for drapes, upholstery and carpets not obtainable otherwise. **No. 1142**

**Potassium thiocyanate labeled with radioactive carbon-14** now available as an intermediate for study of plastics, metallic complexes and in radio-chemical analysis. **No. 1143**

**Two new bodying agents for coating systems** now offered commercially. One is a liquid viscosity modifier for non-thixotropic viscosity increase without affecting flow or leveling. The other is a thixotropic bodying agent in powder form. **No. 1144**

**Via principles of gas chromatography**, new vapor fractometer reportedly gives fast, precise analyses of gases and volatile liquids, and is simple in calculation. Qualitatively, clean separations of difficult isomers can be obtained. **No. 1145**

**A sulfur amino acid** is reported to improve the coat of fur-bearing animals. Field tests indicate that when 1 lb. of the amino acid is added per ton of dry ration, depth and density of underfur are markedly increased. Ability of young to survive after birth is also improved. **No. 1146**

**Automatic burette**, just introduced, has squeezable reservoir bottle for convenient filling with automatic finding of zero point. Reservoir is attached by heavy threaded polyethylene cap—avoids forcing of rubber stoppers. **No. 1147**

**Package units for producing sodium dispersions** can now be obtained, eliminating need for sodium researchers to build their own equipment. Units are complete in every detail and ready to set up. **No. 1148**

**Odor-free emulsion-coupler for flexible polyester foams** recently developed to permit production of plastics with low odor level. Recommended for incorporation at 1 to 2.5% based on total weight of reactants. **No. 1149**

## PRODUCTS OF U.S.I.

### ALCOHOLS:

**Ethyl Alcohol (Ethanol)**—Specially denatured—all regular and anhydrous formulas.

Completely denatured—All regular formulas for industrial use, anti-freeze.

Pure alcohol—USP 190—Absolute, N.F., taxfree, taxpaid.

**Butanol (Normal Butyl Alcohol)**—Latent solvent for nitrocellulose, solvent for ethyl cellulose, many resins, many chemical syntheses.

**Amyl Alcohol, Refined**—Fine chemicals, pharmaceuticals.

**Fusel Oil, Refined**—Blend of amyl alcohols refined by chemical treatment, distillation.

**Proprietary Denatured Alcohol Solvents**

SOLOX®—General-purpose.

FILMEX®—Special, authorized for certain industries.

ANSOL® M—Anhydrous, special blend for lacquers, resins, etc.

ANSOL® PR—Anhydrous, special blend with higher ester content and solvency for lacquers, resins, etc.

### OTHER PRODUCTS:

**PETROTHENE® Polyethylene Resins.**

**Inorganic Chemicals:** Ammonia, Caustic Soda, Chlorine, Metallic Sodium, Sodium Peroxide, Sulfuric Acid.

**Esters, Ethers and Ketones:** Normal Butyl Acetate, Dibutyl Phthalate, Diethyl Carbonate, Diethyl Oxalate, Ethyl Acetate, Ethyl Ether, Acetone.

**Intermediates and Fine Chemicals:** Acetoacetylides, Ethyl Acetoacetate, Ethyl Benzoylacetate, Ethyl Chloroformate, Ethylene, Ethyl Sodium Oxalacetate, Sodium Ethylate solution, Urethan USP (Ethyl Carbamate).

**Animal Feed Products:** Calcium Pantothenate, Choline Chloride Products, Curbay B-G® 80, Special Liquid Curbay®, DL-Methionine, Niacin USP, Riboflavin Concentrates, Vitamin B<sub>12</sub> and Antibiotic Feed Supplements, Vacatone® 40, Vitamin A, D<sub>3</sub> and K<sub>2</sub> Products.

**Pharmaceutical Products:** DL-Methionine, N-Acetyl-DL-Methionine, Riboflavin USP, Urethan USP, Intermediates.

### U.S.I. SALES OFFICES

Atlanta • Baltimore • Boston • Buffalo • Chicago • Cincinnati  
Cleveland • Dallas • Detroit • Houston • Indianapolis • Kansas City, Mo.  
Los Angeles • Louisville • Minneapolis • Nashville • New Orleans  
New York • Philadelphia • Pittsburgh • Portland, Ore. • Salt Lake City  
San Francisco • Seattle • St. Louis



**INDUSTRIAL CHEMICALS CO.**

Division of National Distillers Products Corporation

99 Park Avenue, New York 16, N. Y.

**new commercial chemicals**  
**208-221**

(Continued from page 46)

**208) p-HYDROXYBENZOIC ACID ESTERS AND SALTS** — Chemo-septs are preservatives for cosmetics, pharmaceuticals, food, and industrial products. Chemo Puro.

**209) HYDROXYLATED ALIPHATIC AMIDE** — Nopco GS-10 has hygroscopic and plasticizing properties, has low volatility and syrupy viscosity. Other physicals are similar to glycerine. Sp gr @ 60°F: 1.30. Nopco.

**210) 12-HYDROXYSTEARIN** — Modified non-toxic, waxy, finely-divided white powder, called Thixcin. Effectively gels most non-solvent materials. Temp stable on aging. For coatings, inks. Baker Castor Oil.

**211) INOSINE** — Chromatographically pure for biochemical research. Schwarz.

**212) IODIDE CARRIER** — Monosan IOD is basic iodide carrier. Gives high efficiency at low cost in prep. of Iodophors for germicidal use. Mona Ind.

**213) IODOPHOR** — Biopal CVL-10 is 100%-active nonylphenoxy polyethoxy ethanol-iodine complex, providing 10% available iodine. Has detergent and sanitizing properties. Efficient biocide. Gen. Aniline.

**214) \*ISOFOAMS** — Spray Grade for thermal insulation, has good wt/strength ratio, adheres to substrate. Isofoam F can be molded, for toy filling, padding, sound and shock absorption. Isocyanate Prod.

**215) ISOCTYL ISODECYL PHTHALATE** — Plasticizer NL A-50 for all PVC plastics. Has general balance of properties featuring low volatility, good electrical characteristics. —37° pour. Nat'l Lead.

**216) \*ISOPHTHALIC** — Chemically 1,3-benzene dicarboxylic acid. Makes low volatility, fast dry alkyds; makes hard, tough film, increased flex and impact strength, increased heat distortion temp polyesters. Also makes plasticizers. Oronite.

**217) ISOPHTHALIC ACID ALKYDS** — Long and short oil compounds for finishes. Faster drying, more durability, flexibility. Reichhold.

**218) \*ISOPROPYL ALCOHOL** — Spectroscopically pure grade for spectrophotometry and chromatography. Bottles bear facsimile of actual 220-360 mμ curve for lot. BP: 82.5°. Fisher Sci.

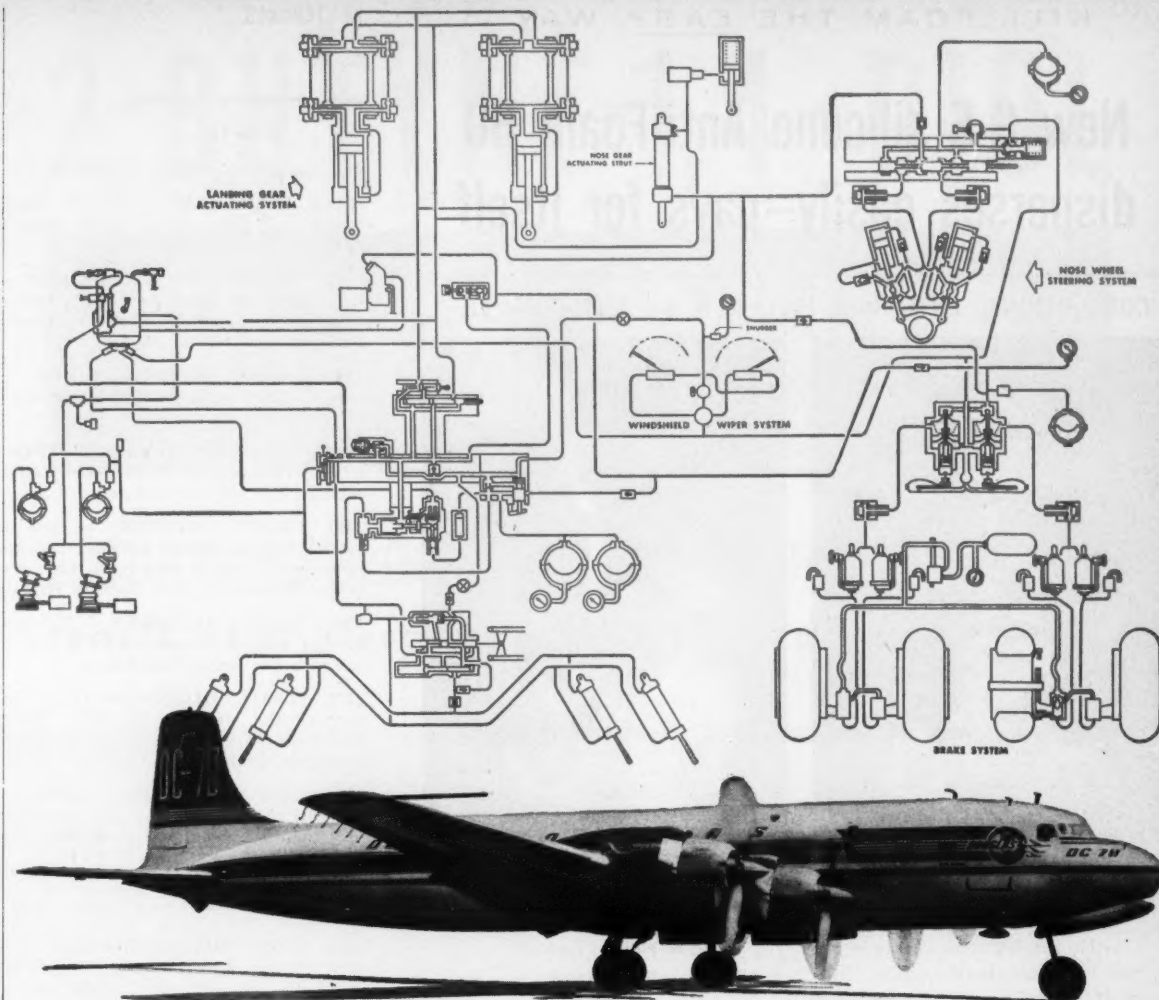
**219) \*N-ISOPROPYL-2-METHYL-1,2-PROPANEDIAMINE** — A curing agent for epoxy resins, stabilizer for melamine and other resin finishes, and a dye intermediate. BP: 147-149°. Comm. Solv.

**219A) ITACONIC ACID** — 99+%. MP: 165-169°. For pharmaceuticals, dyestuffs, complex organics. Pfizer.

**220) \*JUVENON SOIL RETARDANT R** — Reduces soiling of fabrics. Am Cy, Textile Resin Dept.

**221) KARL FISCHER DILUENT** — Reagent grade pyridine for rapid electrometric moisture determinations of foods, chemicals, water and sewage, petroleum fractions. Very stable. BP: 113-116°. Fisher Sci.

(Please turn to next page)



## Enjay Butyl rubber— vital artery in newest airliners

Douglas chooses Enjay Butyl for rubber components of the hydraulic systems in many of its famous DC-7 airliners. These components, which help assure the dependable operation of everything from wing flaps to landing gear, are proving over millions of air miles their durability and resistance to wear.

Versatile Enjay Butyl rubber may well have a place in *your* operation. It will pay you to investigate the many technical advantages it has over other types of rubber. Its price and ready availability are advantages, too. For full information, and for technical assistance in the uses of Enjay Butyl, contact the Enjay Company today.



**ENJAY** Pioneer in Petrochemicals  
**ENJAY COMPANY, INC., 15 West 51st Street, New York 19, N. Y.**

Other offices: Akron • Boston • Chicago • Los Angeles • Tulsa

Enjay Butyl is the super-durable rubber with outstanding resistance to aging • abrasion • tear • chipping • cracking • ozone and corona • chemicals • gases • heat • cold • sunlight • moisture.

For more information on product at left, specify CP 4629 . . . see information request blank opposite last page.

When inquiring check CP 4630 opposite last page



KILL FOAM THE EASY WAY...

## New G-E silicone Anti-Foam 60 disperses easily—pays for itself

### CONVENTIONAL ANTI-FOAM



Conventional high-viscosity silicone anti-foam agents (above) do not disperse readily in water—require vigorous stirring.

### NEW G-E ANTI-FOAM 60



Low-viscosity G-E ANTI-FOAM 60, however, can be poured—and disperses instantly!

Costly, troublesome foaming can now be controlled—more easily—with General Electric's new silicone ANTI-FOAM 60. Easy to disperse, this low-viscosity silicone emulsion can be used as supplied, or reduced with water to any desired concentration. Little or no stirring is required.

**PAYS FOR ITSELF**  
You'll find ANTI-FOAM 60 pays for itself by the way it reduces processing time, eliminates costly boil-overs, increases kettle capacity. Incredibly small amounts are needed, for example: **50 PPM in paper-making operations**  
**3 PPM in textile sizing solution**  
**10 PPM in latex**

FREE  
SAMPLE!



SILICONE PRODUCTS DEPARTMENT  
GENERAL ELECTRIC COMPANY  
Section 160-1C, Waterford, N. Y.

Please send me a free sample of G.E.'s new silicone ANTI-FOAM 60.

Name \_\_\_\_\_ Position \_\_\_\_\_  
Firm \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

IN CANADA: Mail to Canadian General Electric Company, Ltd., Toronto

*Progress Is Our Most Important Product*

**GENERAL  ELECTRIC**

When inquiring check CP 4631 opposite last page

## MATERIALS

### new commercial chemicals

221A-235

(Continued from preceding page)

221A) **KOJIC ACID** — 98+%. An insecticide, antifungal and antimicrobial agent. Intermed. for drugs. LD<sub>50</sub>: > 1000 mg/kg (oral). Pfizer.

222) **LAURIC DIETHANOLAMIDE** — Ninol AA62 Extra has 92% amide content. A detergent, thickening agent, foam stabilizer for cosmetics, household detergents, industrial cleaners. Ninol.

223) **LAURIC, MYRISTIC ACIDS** — Mixture. Replaces lauric acid in detergents, resins, emulsifiers. Gen'l Mills, Chem Div.

224) **\*N-LAUROYL-p-AMINOPHENOL** — Suconox-12 is a non-staining antioxidant for plastics and synthetic rubbers. MP: 123-126°. Sumner.

225) **LAURYL ALCOHOL** — 80% C<sub>12</sub>. Dytol J-68 makes sodium lauryl sulfate, quaternary ammonium compounds, dodecyl mercaptan for cosmetics, synthetic rubber, sanitary chemicals. Rohm & Haas Spec. Prod. Dept.

226) **LAURYL ALCOHOLS** — This narrow-range mixture of n-alcohols melts at 21-23°, is intermediate for surface-active agents. Am. Alcolac.

227) **\*LEAD CHLOROSILICATE COMPLEX** — Economical heat stabilizer for PVC. "Dutch Boy" Lector "60" has high volume resistivity, moisture resistance, low sp gr, easy dispersion. Nat'l Lead.

228) **LEAD CHROMATE** — Yellow for Green 12160 blends with blues, making low cost greens for coatings, inks, plastics, rubber, wallpaper. Sher.-Wms.

229) **\*LINSEED OIL** — 32-X is 100%. Excellent vehicle for high grade one-coat exterior house paints. Cargill.

230) **LOW-SODIUM CHEMICALS** — Na content held to <0.01% in NH<sub>4</sub>Cl, CaCO<sub>3</sub>, Ca gluconate, KCl, K<sub>2</sub>CO<sub>3</sub>, and CaCl<sub>2</sub>. All meet USP specs. Ammonium salicylate NF and CaCl<sub>2</sub> anh. are also in the line. Mallinckrodt.

231) **\*MAGNESIUM OXIDE** — High purity. Grade ER has purity of 99.0+%. Comes in pellet form 3/8" diam. Bulk density: 70-75 lb/cu ft. Has low iron, lime, boron, and low ignition loss. Inter. Min.

232) **MAGNESIUM SILICATE, SYNTHETIC** — Celkate is a selective adsorbent and a decolorizer. Low bulk density, inert. Johns-Manville.

233) **MALEIC ANHYDRIDE** — Molten intermediate shipped ready to use, ease in handling. Nat'l Aniline.

234) **MALONIC ACID** — In manufacture of substituted cinnamic acid from corresponding aldehydes and as an intermediate. 98% pure. Eastern.

235) **MANGANESE DIOXIDE** — 88% min purity. Active depolarizer for dry batteries, gives higher capacity

(Please turn to page 51)

THE QUICK WAY to pin-point a chemical material for a specific application is to use the "Use-Index" on page 32.

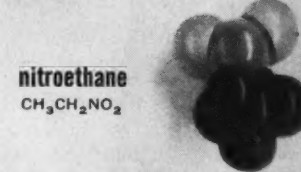
MANUFACTURER ADDRESS LIST starts on page 82. Contact them for additional details.

## The Nitroparaffins

Industry's Newest  
Chemical Building Blocks



nitromethane  
CH<sub>3</sub>NO<sub>2</sub>



nitroethane  
CH<sub>3</sub>CH<sub>2</sub>NO<sub>2</sub>



1-nitropropane  
CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>NO<sub>2</sub>



2-nitropropane  
CH<sub>3</sub>CHNO<sub>2</sub>CH<sub>3</sub>

Learn how the NP's may be of help in improving your present product or in creating new products.

write:

**COMMERCIAL  
SOLVENTS CORP.**

260 MADISON AVE.

NEW YORK 16, N. Y.



Branches in principal cities

When inquiring check CP 4632  
opposite last page

CHEMICAL PROCESSING

## MATERIALS

### Series of polyethylenes designed for electrical insulating uses . . .

molded and extruded product uses also seen

**Uses:** As high frequency and high voltage insulation and, in general, for all wire and cable insulating and jacketing applications. Possible applications may also be in blow molded bottles, closures, and extruded tubing that are exposed to solvent-type materials, detergents, etc.

**Features:** Resin series meets a variety of electrical specs for infantry field wire, line wire covering, TV lead-in wire.

**Description:** Polyethylene resin series is supplied compounded or uncompounded. Melt index values for uncompounded grades are as follows:

Petrothene 300	0.3
Petrothene 301	1.0
Petrothene 302	2.8

(Petrothene® 300 series of electrical grade polyethylene resins is a product of U.S. Industrial Chemicals Co., Div. of National Distillers Products Corp., Dept. CP, 99 Park Ave., New York 16, N.Y. . . . or for more information reader may simply check CP 4633 on form which is located opposite last page.)

### Will sell or lease thorium metal

Limited quantities of thorium metal will be available to industry for use in nuclear reactors or other enterprises involving applications of atomic energy. The metal can be obtained on a lease or sale basis, at revised basic price of \$43.00 a kilogram, from United States Atomic Energy Commission, Washington 25, D.C.

For more information on product at right, specify CP 4634 . . . see information request blank opposite last page.



# 2-BUTYNE-1,4-DIOL



## A BUILDING BLOCK AND CORROSION INHIBITOR *reacts as a glycol and a disubstituted acetylene*

### in synthesis

Replacement of OH  $\longrightarrow$  1,4-Dihalo-2-butyne,  $\text{XCH}_2\text{C}\equiv\text{CCCH}_2\text{X}$

isomerization  $\longrightarrow$  Hydroxymethyl vinyl ketone,  $\text{HOCH}_2\text{COCH}=\text{CH}_2$

Alcohol addition  $\longrightarrow$  Alkyl ether of 1,4-Dihydroxy-2-butanone,  $\text{HOCH}_2\text{COCH}_2\text{CH}_2\text{OR}$

Trimerization  $\longrightarrow$  Hexamethylenecyclopropane,  $\text{C}_6(\text{CH}_2)_6$

Also hydrogenation, esterification, halogenation, hydration, etherification, etc.

### as a corrosion inhibitor

Butynediol is effective alone or in blended formulations as a corrosion inhibitor for mineral acids, especially sulfuric acid.

### other uses

Stabilizer for halogenated compounds. Chemical intermediate for pharmaceuticals, solvents, explosives, plasticizers, etc.

### properties

Solid, m.p. 57.5° C, b.p. 140° C (10 mm.). Also available as a 35% aqueous solution.

Now available in large commercial quantities from  
GAP's new high pressure acetylene chemicals plant

For technical  
information,  
price schedules  
and samples  
write to:

**ANTARA**



ACETYLENE CHEMICALS DEPARTMENT  
**ANTARA CHEMICALS**  
A SALES DIVISION  
GENERAL ANILINE & FILM CORPORATION  
435 HUDSON STREET, NEW YORK 14, NEW YORK

*From Research to Reality*



A. D. Schnurr (right), Kalo Brick & Tile Company president and Standard Oil lubrication specialist Roland C. Bleimehl discuss plant lubrication requirements. Providing technical service on lubrication is something for which "Rollie" Bleimehl is well qualified. Rollie is a mechanical engineer with a degree from Iowa State College and a graduate of the Standard Oil Sales Engineering School. He's been an industrial lubrication specialist for 10 years with the Standard Oil Company. Customers find his experience and training pay off for them.



Large open gear, such as this one in Kalo Brick & Tile plant, suffered excessive gear tooth wear until their Standard Oil man suggested switch to CALUMET Viscous. New lubricant eliminated throw off, reduced gear replacement and maintenance.

## CALUMET Viscous Lubricant solves gear lubrication problem for Kalo Brick & Tile Company

*Long-time Standard customer receives another demonstration of effectiveness of Standard Oil Products and technical service.*

The Kalo Brick & Tile Company, Fort Dodge, Iowa was experiencing trouble with the lubrication of open gears. The lubricant used lacked adhesive qualities and was being thrown off resulting in excessive gear tooth wear. In addition, the lubricant had to be heated before application.

As they had done in so many cases during sixty-five years as a Standard Oil customer, Kalo management called in a Standard industrial lubrication specialist. Inspection and recommendation by the Standard man resulted in a switch to CALUMET Viscous Lubricant for open gears. Kalo Brick & Tile Company got these results: gears received an effective shield that did not throw off, life of gears was lengthened and lubrication maintenance and attention greatly reduced, no preheating of CALUMET Viscous Lubricant was required so this messy job and the preheating equipment were eliminated.

No matter what the problem, chances are Standard Oil lubricants and technical service can help you solve it. Try them. Call your nearby Standard Oil lubrication specialist in any of the 15 Midwest and Rocky Mountain states. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.



Kalo Brick & Tile Company plant, Fort Dodge, Iowa found solution to gear lubrication problem by using CALUMET Viscous Lubricant.

### Quick facts about CALUMET Viscous Lubricant

- Not a residual product but a true grease carefully manufactured from selected soaps, oils and additives.
- Good wetting ability. Gives lubricant superior adhesiveness, makes it resistant to washing.
- Has very high load-carrying capacity. CALUMET Viscous grease formula is especially designed to provide effective shield under heavy load.
- Resistance to heat. Since it is a true grease compound, CALUMET Viscous has extreme stability, does not thin out under high heat.



**STANDARD OIL COMPANY**  
(Indiana)

## MATERIALS

### Indicators and reagents included in organics added to line

An indicator stain specific for unbleached sulfite pulp, 4,4'-azobis (N,N-dimethylaniline) permits differentiation between kraft and unbleached sulfite pulp. Naphthadine, a second organic, is an oxidation-reduction indicator, an internal indicator, for precipitated zinc complex, and a starting point for new azo dyes.

Reagents added to the list are *p*-chloromandelic acid, a zirconium reagent; and 3,4-dinitrobenzoic acid, a colorimetric sugar reagent.

Other chemicals are: *p*-chlorobenzenethiol, dichloromaleic anhydride, methyl mercaptoacetate, oxalyl dihydrazide, thiophene, and trimethylphenylammonium benzene-sulfonate.

(Products of Distillation Products Industries, a Div. of Eastman Kodak Co., Dept. CP, Rochester 3, N.Y. . . . or for more information check CP 4635 on form which is located opposite last page.)

### Floor waxes, inks, paints helped by leveling agent

**Uses:** As a leveling agent for floor waxes, inks, paints, leather dressings.

**Features:** Agent helps produce smooth, even, clear films, and improves gloss.

**Description:** Resinous product contains 75-80% solids in water. A clear, yellow anionic liquid, it has an iodine value of 60-62. It is most effective with copolymer latices.

(Levelon is a product of Abco Chemical Co., Dept. CP, 2316 Atlantic Ave., Brooklyn 33, N.Y. . . . or for more information check CP 4636 opp. last page.)

For more information on product at left, specify CP 4637 . . . see information request blank opposite last page.

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236) w  
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238) m  
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239) g  
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241) M  
Mixture

242) t  
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243) s  
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pure. C

244) b  
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245) N  
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246) B  
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247) t  
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248) M  
Mixture

248A) 81.4°. A  
resins,  
complex

249) p  
pure g  
Bottles  
lot. BP

250) 2  
95+%

251) f  
formula

Unle

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Boil  
Tem  
Solu



new commercial chemicals  
236-251

(Continued from page 48)

and longer life. Am. Potash &amp; Chem.

236) METHANOL, ANHYDROUS — Contains &lt;100 ppm water, for Karl Fischer titrations. Mallinckrodt.

237) 3-METHOXY BUTANOL — BP: 161.1°. Intermediate for plasticizers, synthetic lubes, surface-actives, selective herbicides. It is a solvent and modifier. Film-forming aid in paints. Celanese.

238) \*METHYL ACETOACETATE — 95+%. Intermediate. 73% of molecule is reactive group. Aceto.

239) \*METHYL ALCOHOL — Spectroscopically pure grade for spectrophotometry and chromatography. Bottles bear facsimile of actual 220-360 mμ curve for lot. Toxicity: 200 ppm. Fisher Sci.

240) METHYL BROMIDE — 100%. Kills insects, rodents. Rapid volatilization and diffusion. Non-explosive, non-flammable. Kolker.

241) \*METHYL CAPRYLATE-METHYL CAPRATE — Mixture. Plasticizer manufacture. Gen'l Mills, Chem Div.

242) METHYL ESTER OF COCONUT OIL — Detergent manufacture. Non-toxic. Gen'l Mills, Chem Div.

243) METHYL GLUCOSIDE — Crystalline, nonhygroscopic polyhydric alcohol useful in making drying oils, varnishes, resins, plasticizers, surface-active agents. 99+% pure. Corn Prod.

244) METHYL HEXYL KETONE — 90-95%. High boiling solvent, intermediate. Wal-Tiernan Harchem.

245) METHYL LAURATES — Detergent manufacture. Non-toxic, water white. 92 or 96%. Gen'l Mills, Chem Div.

246) METHYL MERCAPTAN — 99% pure (by wt). BP: 4.5°. Can be used in methionine synthesis. Gives highly reactive organic sulfur at low cost. Sharples.

247) METHYL MYRISTATE — Detergent manufacture. Non-toxic, water white. Gen'l Mills, Chem Div.

248) METHYL PALMITATE-METHYL OLEATE — Mixture. Plasticizer manufacture. Gen'l Mills, Chem Div.

248A) METHYL VINYL KETONE — 97+%. BP: 81.4°. A copolymer for adhesives, coatings, ion exchange resins, and as intermediate for pharmaceuticals and complex organics. Pfizer.

249) \*METHYLENE CHLORIDE — Spectroscopically pure grade for spectrophotometry and chromatography. Bottles bears facsimile of actual 220-360 mμ curve for lot. BP: 40-41°. Fisher Sci.

250) 2-METHYL-2-n-PROPYL PROPANEDIOL-1,3 — 95+%. Intermediate: resins, pharmaceuticals. Millmaster.

251) \*METROLIN # 2 — Odorless, proprietary formula. Enamel vehicle. Brown-Allen.

(Please turn to next page)

Unless otherwise specified . . .

Pressures are in mm of mercury (abs.)

Boiling points are at 760 mm

Temperatures are in °C

Solubilities are at room temperature

## vital protection where it's needed most

DOW



## DOWICIDE PRESERVATIVES

*prevent rot and discoloration  
in automobile trunk linings;  
prolong fabric service life*

Natural humidity and moisture from spilled ice, food and other materials contribute to mildew and rot that can cause serious damage to automobile trunk linings. Use Dowicide® preservatives to treat these linings. Clean, low-odor Dowicide preservatives help prevent discoloration and

weakening of the fabric. They provide excellent protection — yet their cost is very low.

Applications for Dowicide preservatives, fungicides and germicides range far and wide. They protect building materials from termites and decay, prevent product breakdown in latex paints, and extend the life of liquid household waxes. Textile, adhesives, leather, farming, petroleum, pulp and paper and many other industries find that the extra protection available with Dowicide preservatives means *extra years* of product sales or service life.

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When inquiring check CP 4638 opposite last page

# Quaker



## SUCTION HOSE that stands the acid test...



Your Quaker-Quaker Pioneer distributor can keep you abreast of the latest cash saving developments in rubber products—and also bring you the advantages of our engineering and research facilities for your tough technical problems. Write for free brochure and name of your Quaker-Quaker Pioneer distributor.

The sharp bite of 100% hydrochloric or 50% sulfuric acid will not affect this acid suction hose. Neither will tannic nor carbonic acid . . . nor alkalis and scores of other chemical solutions.

Tube is of a heavy gauge, acid-resisting compound, reinforced by multiple plies of close-woven fabric, with a helix of high tensile steel wire embedded in rubber. The cover is of medium gauge stock for high resistance to abrasive, salts and acids. Ends of the hose are capped to prevent chemical action to the fabric plies. It can be furnished with integral rubber flanges to eliminate the use of metal fittings.

Available in I.D. sizes 1½" through 3"; lengths up to 50 feet. Couplings are specially chosen to resist the particular acid encountered; or the hose can be furnished with rubber and duck flanges with metal retaining rings. Complete line also includes belting, packing and moulded rubber for every use.

**H. K. PORTER COMPANY, INC.**

**QUAKER RUBBER DIVISION**

**Philadelphia 24, Pa.**

**QUAKER PIONEER RUBBER DIVISION**

**San Francisco 7, California**

When inquiring check CP 4639 opposite last page

## MATERIALS

### new commercial chemicals 252-288

(Continued from preceding page)

252) **MODIFIED AMINE** — Curing agent for low mw epoxies. Room temp cure. Shell.

253) **MODIFIED ESTER OF CASTOR OIL** — Nopco 2221-P is softener for rayon tire yarn finishes. Treated fibers have low fiber-to-fiber friction ratios. Insol. in water. Sp gr (27°): 0.932. Nopco.

254) **MOLYBDENUM ORANGE** — Shows better light fastness, hiding power, and tinting strength in paints. Climax Moly.

255) **MONOETHANOLAMINE** — Production of emulsifiers, dispersers, rubber accelerators. Nitrogen-Allied.

256) **MONOPENTAERYTHRITOL** — Dust free and "zero ash" content. Hercules.

257) **MOREPEL RW** — Blend of waxy materials and heavy metal ions. Renewable water repellent for cotton, synthetics. Fine particle size. Moretex.

258) **\*NEOPENTYL GLYCOL** — Min purity: 96%. MP: 124-130°. Intermediate for polymeric plasticizers, polyester resins. Modifies alkyd resins. Compound has short chain length, is sym. and reactive. Eastman C.P.

259) **NIAGARA COPPER BLACK BROWN** — Cotton, rayon. Fast to rubbing, washing. Nat'l Aniline.

260) **NITROGEN SOLUTIONS** — Source of nitrogen for fertilizers, direct application. Nitrogen-Allied.

261) **NITROGEN TETROXIDE** — Non-corrosive oxidizing agent, catalyst. Intermed. Nitrogen-Allied.

262) **NONIONIC SOFTENER** — Dextrol GM-94, with water, forms both permanent and non-permanent water repellents on textiles. Has no wetting or rewetting properties, won't effect spray ratings. Dexter.

263) **\*NONIONIC SOFTENERS** — Warcolene 350 is non-yellowing textile softener. Warcolene 362-M is used as sanforizing assistant. Warwick.

264) **NONIONIC SURFACE-ACTIVE AGENT** — Triton CF-10 is 100% active low-foaming detergent. Rohm & Haas Textile Chem. Dept.

265) **NONIONIC SURFACE-ACTIVE AGENTS** — Lavepons WS-1 and WS-2 for wool scouring, detergency. 100% active. Rohm & Haas Textile Chem. Dept.

266) **OCTYL AND DODECYL GALLATES** — Chemox powders are specialty antioxidants. Chemo Puro.

267) **\*OCTYL BUTYL PHTHALATE** — Pz 84, an octyl butyl phthalate, plasticizes nitrocellulose to produce films of superior permanence and cold check resistance. Eastman C.P.

268) **OCTYLPHENOXYETHANOLS** — 70% aq solns. Three grades (OPE-16, -20, -30) differ in mw. Surface-active agents have high water solubility, even above the BP. Compat. with hard water, salt solns, polar organics. Rohm & Haas Spec. Prod. Dept.

269) **OLEORESINOUS VEHICLE** — FV 726 is for wrinkle finishes, yields uniform pattern and hard finish. 60% N.V. Vis: T-U. Farnow.

270) **\*OIL RED ED** — Dye for oils, plastics. Am Cy.

271) **PENTACHLORONITROBENZENE** — Terraclor controls soil-borne fungi. Stable LD<sub>50</sub> (rats): 1800 mg/kg. Long residual action, compatible. Olin Mathieson.

272) **PENTAERYTHRITOL** — Non-dusting. Hercules.

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H. K. PORTER COMPANY, INC.



273) **PENTAERYTHRITOL-SATURATED ALIPHATIC ACID ESTER** — Herculflex 600 is primary plasticizer for vinyl resins, other thermoplastics. Stable to heat and light; good flex, electrical prop. Hercules.

274) **\*PERMEL RESIN B** — Water repellent for various fibers. Improved tear strength. Am Cy.

275) **m-PHENYLENEDIAMINE** — 99+% free isomer. Epoxy resin hardener, dyestuff intermed. Gen. Aniline.

276) **\*PHTHALIC PLASTICIZER** — Polycon No. 40 plasticizes PVC resin for films, sheeting, floor covering. Low cost. Brown-Allen.

277) **PIGMENT DISPERSIONS** — 0100 Series are ultra-fine color pigment dispersions in paste form. Extreme fineness saves equipment time and eliminates much off-color scrap. Acheson Disp. Pigments.

278) **PIGMENT GREEN B 15-4010** — Printing inks. Resists alkali, soap. Warm tone. Am Cy.

279) **POLYACRYLAMIDE** — Stable, neutral polymer. Thickener, aqueous soln. Am Cy.

280) **POLYACRYLATE** — Good-rite K-720S has high efficiency in water clarification, as filtration assistant. Goodrich Chem.

281) **\*POLYALKYLENE GLYCOL ETHER** — Tergitol Nonionic XD is an emulsifier for oils, waxes, agricultural concentrates. Is used in low-foaming detergents, latex formulations. MP: 28-38°. Carbide & Carbon.

282) **\*POLYALKYLENE GLYCOL ETHER** — Tergitol Nonionic XH is a detergent and emulsifier at elevated temp. Cloud pt (0.5% aq soln): 85-95°. Carbide & Carbon.

283) **\*POLYAMIDE RESIN** — Fluid. In epoxy systems for impact resistance, flexibility. Gen'l Mills.

284) **\*POLYAMINE DERIVATIVE** — Endcor is a polypolar organic of high mw. A film-forming inhibitor for use with petroleum oils, it is very stable. Solubility is inherent in compound; it is readily dispersible in water and brine. Has demulsification properties. May find use in cooling water treatment. Dearborn.

285) **POLYELECTROLYTE** — Nalco No. 600 reacts quickly with minute particles in water, coagulates them into a rapidly settling floc. Increases throughput rates, replaces other coagulants, or permits reduction in their dosage by up to 50%. Sl. viscous, high mw organic. Nat'l Aluminate.

286) **POLYESTER RESINS** — For polyurethane foams, flexible, rigid. Give dimensional stability, strength. Reichhold.

287) **POLYESTER RESINS** — Series of IC resins for hand lay up operations, in boat industry, glass fiber surfacing. Interchem.

288) **\*POLYETHYLENE** — Super Dylan® has two to three times the mechanical strength of conventional polyethylenes, while retaining the other properties. Heat

(Please turn to next page)

THE QUICK WAY to pin-point a chemical material for a specific application is to use the "Use-Index" on page 32.

MANUFACTURER ADDRESS LIST starts on page 82. Contact them for additional details.

## HEXYLENE GLYCOL

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SOLUBILITY

WATER  
SOLUBILITY

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	Caprylic	Pelargonic	Capric	Lauric
Carbon Atoms	8	9	10	12
Molecular Weight	144	158	172	200
Melting Point, °C	12	10	30	42
Boiling Point, °C at 760 mm.	238	255	270	299
Iodine Value	1	nll.	1	1
Acid Value	398	350	325	288

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Company.....  
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City.....Zone.....State.....

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## MATERIALS

new commercial chemicals  
289-314

(Continued from preceding page)

resistance is also increased as only slight deformation is noted to 250°F. Koppers.

289) **POLYETHYLENE EMULSION** — Moropol X-105. Anionic, 28-30% active. Textile softener, improves abrasion resistance, tear strength, spray rating when used with finishes. Moretex.

290) **POLYETHYLENE LUBRICANT** — Plaskon Lubricants 8406, 8416, 8407, 8417, 8429 reduce tack, help mold release, cut bloom for rubber, vinyls. Barrett.

291) **POLYETHYLENE WAX, EMULSIFIABLE** — Epolene E is a low-mw wax, easily emulsified to give polishes of high gloss, good flow-out properties, and resistance to scuff and dirt pickup. Very compatible. Ring and ball softening point is 102°. Eastman C.P.

292) **POLYETHYLENE WAX, NON-EMULSIFIABLE** — Low-mw wax has extreme hardness and toughness, with low viscosity and moderate MP (softens: 106°). Epolene N is compatible with many natural and synthetic waxes and resins, and finds many uses. Eastman C.P.

293) **\*POLYETHYLENES** — A-C. Atomized intermediate, rubber, elastomers, plastics. Ease in handling, dispersing. Semet-Sol, Petro, Allied.

294) **POLYISOCYANATE RESIN** — Nafil resin and catalyst are mixed, expand up to 30 times. Can be foamed-in-place, applied by spray or pouring, has excellent adhesion. Fumes should be avoided. Uses: insulation, sound deadening, shock absorbing, buoyancy, acoustical treatment. Chase Chem.

295) **POLYOXYALKYLENE ETHANOL TYPES** — Emulphogenes BC-720 and -840 are nonionic surface-active. Stable. Foam stabilizers, detergency promoters, solubilizing agents for alkyl aryl sulfonates. BC-840 is more hydrophilic. Gen. Aniline.

296) **POLYOXYETHYLENE ETHER OF AN ALKYLATED PHENOL POLYMER** — Nopco 1525-L is a 100%-active nonionic liquid surface-active agent used for making emulsifiable agricultural toxicants. Softens several synthetic fibers, is dry cleaning detergent, alkyd resin emulsifier. Nopco.

297) **\*POLYSTYRENE EMULSION, MODIFIED** — U-2002 Ubatol is a base for making floor wax. It has ultra-fine particle size, highly water-resistant film. Union Bay State.

298) **POLYVINYL ACETATE EMULSION** — Nopcoset B is a modified emulsion of anionic type. Has quick setting time, good wet tack, dries to form clear, pliable, tough films. Easy to formulate into adhesives. About 55% solids, 1100 cps viscosity. Nopco.

298A) **POLYVINYL ACETATE EMULSION, INTERNALLY PLASTICIZED** — Resyn 783058 is an adhesive base and paper saturant. Has specific adhesion to Mylar film. Rubber-like properties, won't significantly lose flexibility on aging. Nat'l Starch.

298B) **\*POLYVINYL ACETATE EMULSIONS** — Resyn 251006 has 60% solids, is compatible with dextrans. For making remoistening adhesives. Resyn 251035 gives clean, glossy, water resistant, heat stable films; is a binder for paper and synthetic fiber. Nat'l Starch.

299) **POLYVINYL ACETATE HOMOPOLYMER** — Polacet for water-based coatings gives stability to light and oxidation, resistance to fats, oils and greases, freedom from putrefaction, and excellent moisture permeability. Min solids: 55%. Harshaw.

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CHEMICAL PROCESSING

300) **POTASSIUM CHLORATE** — 99.5%. Powerful oxidizing agent. For pyrotechnics, munitions. Fairly toxic. Am. Potash & Chem.

301) **POTASSIUM PERCHLORATE** — 99.5%. A strong oxidizing agent. For rocket propulsion, fuses, flares, munitions. Am. Potash & Chem.

302) **PROPIONALDEHYDE** — BP: 47.9°. Makes trimethylol amine for alkyd resins, polyesters for urethane foams; reacts with phenol to form phenolic resins; Aldal condensation gives 2-methyl 1-pentanol and derivatives; chemical synthesis. Carbide & Carbon.

303) **PROPIONIC ACID** — BP: 141.1°. Intermed: mold inhibitors; herbicides; fungicides; plastics; polymers for latex paints and resins; esters for flavors, solvents, and plasticizers. Carbide & Carbon.

304) **\*PYROLUX MAROON** — D-3148 for plastics, inks, rubber, paint. Heat, light resistant. Sher.-Wms.

305) **\*PYROSET FIRE RETARDANT N-2** — For nylon. Exceptional stability. Durable. Am Cy.

306) **\*QUATERNARY AMMONIUM ANION EXCHANGE RESIN** — Duolite A-103 for anion removal, esp. in non-aq systems. Has high thermal stability, regeneration economy, distinct color difference between acid and base forms, bead form. Tech. grade. Chem. Process Co.

307) **\*QUATERNARY AMMONIUM ANION EXCHANGE RESIN** — Permutit SK for uranium recovery. Has high capacity, exc. elution properties. Permutit.

308) **\*QUATERNARY AMMONIUM ANION EXCHANGE RESIN, TYPE 1** — Duolite A-101 comes in bead form, has high porosity, high thermal stability. For water demineralization, color removal, weak acid removal. Tech. grade. Chem. Process Co.

309) **\*QUATERNARY AMMONIUM ANION EXCHANGE RESIN, TYPE 2** — Duolite A-102 comes as beads. It has high porosity and regenerates economically with alkali. Uses: water demineralization, color removal, weak acid removal. Tech. grade. Chem. Process Co.

310) **RESIN-METAL** — Arcco Resmetal comes as high viscosity paste. Catalyzed room temp cure gives metallic solid. Has good adhesion, machining properties. Borden, Resinous-Reslac Dept.

311) **SAFETY SOLVENTS** — Darsols 195, 350, 600, and 650 are similar to CCl<sub>4</sub>, but 1/10 as toxic. Fast drying, they leave no film. Dacar.

312) **SALICYLANILIDE** — Salnide powder is fungicide for varnishes, textile sizings, yarns. Chemo Puro.

313) **\*SEMI-POLYMERIC ALKYL PHTHALATE** — Primary plasticizer NL F-22 for PVC plastics. Outstanding low-temp flex, low volatility. Pours: -46°. Nat'l Lead.

314) **\*SILICA GEL, FINELY DIVIDED** — Syloid 72 has avg. particle size of 3-5  $\mu$ , density of 8.9 lb/cu ft. Anti-caking agent, flattening agent in clear finishes, bodying

(Please turn to next page)

Unless otherwise specified . . .

Pressures are in mm of mercury (abs.)

Boiling points are at 760 mm

Temperatures are in °C

Solubilities are at room temperature

# BRIEFS

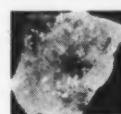
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Paradichlorobenzene

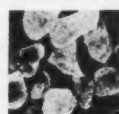
Caustic Soda

Fire-safe Ductwork

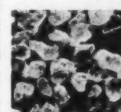
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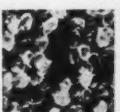
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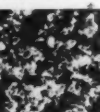
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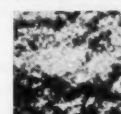
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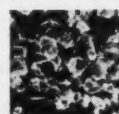
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**Grinding your own.** You can now get PARADI in two new forms—solid and molten. If you are prepared to process

the finished product from these forms and your volume is above 600 tons a year, we suggest you consider solid and molten PARADI for possible savings.

For a helpful bulletin and technical data on PARADI, mail the coupon. Write on your letterhead for samples.

**New caustic soda supply point.** Put a pin just north of Vancouver, B.C., on your map of caustic soda supply points.

Here in the city of North Vancouver, early in 1957, a new \$11 million chlor-alkali plant will go on stream. At the new plant's masthead will fly the colors of Hooker Chemicals, Ltd. It will be built and operated by Canadians, for industry in Canada.

This new Hooker plant will be Western Canada's first domestic source of caustic soda and chlorine. It will shorten supply lines, provide small but real freight savings, eliminate the need to pay duties on caustic and chlorine, and make for faster service.

If your company is already operating plants in British Columbia, or plans to build in this great, growing territory, this is a good time to discover how Hooker Chemicals, Ltd., can serve you. A note to us on your company letterhead will bring you the story.

**Fire-safe ductwork pares corrosion costs.** This plastic ductwork safely channels acid fumes that can

bite through metal ducts within a few weeks.

It's made with glass-reinforced HETRON®, a Hooker polyester that handles most common acids and many common organic materials and gases, wet or dry, with little or no corrosion.

HETRON is fire-resistant, too—so you will find this ductwork and other HETRON equipment in plants where polyesters could not be used before. HETRON parts burn slowly under the direct flame of a blowtorch, but snuff out immediately as soon as the flame source is removed.

Add to fire- and corrosion-resistance these other qualities of HETRON: great structural, flexural, tensile, and impact strength; high resistance to heat and weathering; very low water absorption. With all these virtues, HETRON, in the long run, costs less than anything else for handling corrosive fumes and smoke.

You can get an entire ventilating system—blowers, fume hoods, scrubbing towers, air ejectors, and fittings—made with HETRON. This is just one of many uses it's finding in industry.

If you would like the names of fabricators producing ductwork and other process equipment with HETRON resins, write us on your business letterhead. For complete data files on the resins themselves, check and mail the coupon.

For technical data on products mentioned on this page, check here:

- ☐ PARADI
- ☐ HETRON polyester resins
- ☐ Caustic soda, liquid
- ☐ Caustic soda, flake and solid

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AND  
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UNADOL 40 and UNADOL 90—two more new fatty alcohols—are now available from Archer-Daniels-Midland.

The new unsaturated alcohols are liquids—almost water-white. The principal component of UNADOL 40 is *linoleyl* which possesses two double bonds. The principal component of UNADOL 90 is *linolenyl* which contains three double bonds.

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Now available for immediate shipment in tank-car or LCL quantities from Ashtabula, Ohio. For samples—and for our new bulletin with chemical reactions of 30 new fatty alcohols, write on your letterhead.

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## MATERIALS

### new commercial chemicals 315-347

(Continued from preceding page)

agent, provision of "pencil tooth" on coated papers. Davison.

315) \***SILICA GEL, LOW DENSITY** — Syloid 244 weighs 4.5 lb/cu ft, has most particles <1  $\mu$ . Will absorb 240 lb oil/100 lb gel. Uses: anti-blocking of clear plastic films, as ink additive, flattening vinyls, cosmetic ingredient, anti-caking powders, thickening fluids such as in pharmaceuticals and plastics. Davison.

316) \***SILICA GEL, PRE-ATTRITED** — Reduces water content of natural gas to 4 lb/MMSCF. Davison.

317) **SILICA-ALUMINA CATALYST** — Contains 13% alumina. High stability of surface area, pore volume, catalytic activity in petroleum cracking. Davison.

318) **SILICA-ALUMINA CATALYST** — Contains 25% alumina. Maintains activity and surface area, lowers stack losses as fluid petroleum cracking catalyst. Davison.

319) **SILICONE ANTIFOAM** — Anti-Foam 60 for aqueous processing systems. Easy to handle, efficient. GE Silicone.

320) \***SILICONE COMPLEX EMULSION** — Norane Silicone is a durable water repellent for textiles. Organic silicone complex emulsion. Warwick.

321) \***SILICONE COMPOUNDS** — Release agents have anti-wear, lubricity properties. X-525 is moderate viscosity fluid, water sol. X-526 is soft low melting wax, water sol. X-527 is low viscosity fluid, sol in aromatics, insol in water. UCC Silicone.

322) \***SILICONE COMPOUNDS** — Series has excellent lubricity, anti-wear properties, for use in cosmetics, as lubricants. X-520 is a moderate viscosity fluid, water sol. X-521 is a soft, low melting wax, water sol. X-522 is low viscosity fluid, sol in aromatics, insol water. UCC Silicone.

323) **SILICONE EMULSION** — Silver Pruf Y is a 50% emulsion, non-toxic. It is a size, after-coating, lubricant in resin finishing to insure tear strength and reduce abrasion. Very compatible and stable. Carolina Aniline.

324) **SILICONE GREASE** — Versilube G-300 Grease is general purpose lube for extreme temps. Outstanding heat and shear stability, excellent VI. GE Silicone.

325) \***SILICONE GUM** — Silastic 432 Base is partly compounded, minimizing mill time. Dow Corning.

326) **SILICONE GUM** — W-95 for compounding silicone rubbers. UCC Silicone.

327) \***SILICONE GUM** — W-96 for compounding rubbers with low compression set, controlled reactivity, one-step thick section curing. UCC Silicone.

328) **SILICONE LUBRICANT** — Versilube F-50 Fluid has thermal stability, low viscosity-temp coefficient. GE Silicone.

329) **SILICONE RESIN** — SR-112 is vehicle for making heat resistant paints. Retains gloss. GE Silicone.

330) **SILICONE RUBBER COMPOUNDS** — For molding, calendaring, extrusion. SE-740 has 40 Duro. SE-750A has 50 Duro. Resist 600°F temp. GE Silicone.

331) \***SILICONE RUBBER COMPOUNDS** — For molding, extruding, calendaring, roll covering. Low compression set, no toxic additives used, rapid one-step thick section cure with catalyst DTBP. Called K-1025 and K-1028. UCC Silicone.

# GREENS

## 4 Pure Chromium Oxides and 2 Hydrated Chromium Oxides

Most stable of the green pigments. Unaffected by acids, alkalis, vehicles, and solvents. Non-fading.

The 4 pure chromium oxides will withstand ceramic temperatures. Use them in applications requiring permanency—enamels, emulsion paints, rubber, plastics, floor coverings, roofing granules, building materials, etc.

Use the 2 hydrated chromium oxides for obtaining brilliant color and transparency in automotive finishes, high grade enamels and lacquers.

Your nearest Williams representative will be glad to provide you with full technical data and samples.

## WILLIAMS COLORS & PIGMENTS

EASTON, PA. • E. ST. LOUIS, ILL.  
EMERYVILLE, CAL.

When inquiring check CP 4645  
opposite last page

CHEMICAL PROCESSING

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332) \*SILICONE RUBBER COMPOUNDS — For molding, extruding. K-1035 and K-1038 have very low compression set, no toxic additives, very good live steam resistance. UCC Silicone.

333) SILICONE RUBBER DISPERSION — SE-501SU for soln coating of cloth. Adheres well. GE Silicone.

334) SILICONE RUBBER GUM — SE-52. To formulate silicone rubber compounds. GE Silicone.

335) SILICONE RUBBER GUMS — For making silicone rubber compounds with low compression set without need for toxic additives. Gum 18567 has lower shrinkage than Gum 18566. GE Silicone.

336) \*SILICONE-ALKYD RESIN — Sylkyd 1400 Class B electric motor impregnant provides greater heat stability. Dow Corning.

337) \*SILICONE-ALKYD VARNISH — Sylkyd 1090 insulates and bonds glass-served magnet wire for electrical equipment. Gives heat stability. Dow Corning.

338) SODIUM ALGINATE PRODUCTS — Tech, refined. Use: textile print paste thickeners. Keltex S for alkaline pastes, is readily sol in cold water, needs no buffers. Keltone has extra high viscosity for better economy. Kelco.

339) SODIUM ALKYL NAPHTHALENE SULFONATE — Nekal BX-78 is approx 75% active. Anionic wetting, dispersing, stabilizing, penetrating agent. Stable. Gen. Aniline.

340) \*SODIUM ALKYL BENZENESULFONATE — High density, non-toxic detergent. 40% active. Nat'l Aniline

341) SODIUM CARBONATE — Soda ash. Dow.

342) SODIUM CHLORATE — 99.5%. Powerful oxidizer. Weed Killer, defoliant, intermediate for pyrotechnics, pulp and paper bleaches. Am. Potash & Chem.

343) SODIUM HEXAMETAPHOSPHATE — Hy-Phos is 65-67%  $P_2O_5$ , balance  $Na_2O$ . Uses: sequestering, cleaning, boiler and condenser water treatment, rust and scale inhibitor, in soap and synthetic detergent formulations, dyeing and tanning. MP: 590°. No internal toxicity up to 7 ppm. IP Thomas Div, Pennsalt.

344) SODIUM LAURYL SULFATE — For shampoo formulations, emulsions. Uniform viscosity. Raymond Labs.

345) \*SODIUM LAURYL SULFATE — Texapon Z needles are dust-free, of high (90+%) purity. For cosmetic, pharmaceutical creams, ointments. Falck Prod.

346) \*SODIUM METHACRYLATE — 98.5-99.0%. Makes plastics, coatings resins, and polymers for treating leather, textiles, paper. Rohm & Haas Spec. Prod. Dept.

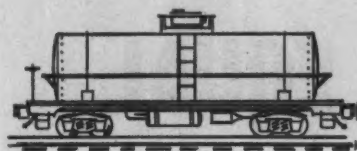
347) \*SODIUM N-METHYL DITHIOCARBAMATE — Vapam kills soil pests: weeds, plant diseases, nematodes, insects before planting. It is safe and easily

(Please turn to next page)

THE QUICK WAY to pin-point a chemical material for a specific application is to use the "Use-Index" on page 32.

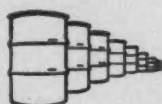
MANUFACTURER ADDRESS LIST starts on page 82. Contact them for additional details.

AVAILABLE IN



TANK CAR

AND



DRUM QUANTITIES

**Du Pont**  
**Hytrol® O**

Cyclohexanone Solvent

Whether you require one drum or tank car lots, delivery of Du Pont "Hytrol" O is made promptly upon receipt of your order.

"Hytrol" O is shipped as follows:

- Tank cars—8,000-gallon or 10,000-gallon capacities.
- Non-returnable drums, 55-gallon capacity—net weight 430 lbs.

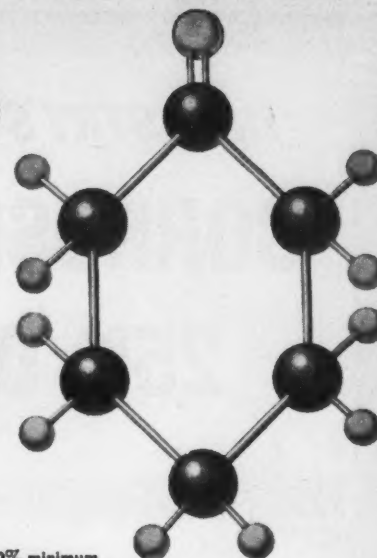


BETTER THINGS FOR BETTER LIVING  
... THROUGH CHEMISTRY

**Polychemicals**  
DEPARTMENT  
**CHEMICALS • PLASTICS**

**Investigate**  
**DU PONT**  
**HYTROL® O**

Cyclohexanone Solvent ( $C_6H_{10}O$ )



**SPECIFICATIONS\***

- Cyclohexanone content.....97.70% minimum
- Color, g.  $K_2Cr_2O_7$ /l.....0.005 maximum

**PROPERTIES**

- Boiling Point at 760 mm.....156.7°C. (314.1°F.)
- Specific Gravity 20°/4°C.....0.9478
- Flash Point (Open Cup).....129°F. (53.9°C.)
- Viscosity: 17.2°C.....2.30 centipoises  
39°C.....1.55 centipoises  
66.1°C.....1.01 centipoises
- Evaporation Time (Ether 1).....40.6
- Soluble in ether, alcohol and most organic solvents.
- Solubility in water decreases with increasing temperature.
- Corrosion characteristics: Not corrosive to metals under normal conditions.

**PRINCIPAL USES**

**FINISHES:** Solvent for lacquers, especially those containing nitrocellulose or polyvinyl chloride and its copolymers... as a thinner for such lacquers. Prolongs drying period of lacquers.

**PLASTICS:** Solvent for resins, including polyvinyl chloride and its copolymers and methacrylate ester polymers. An intermediate for cyclohexanone and cyclohexanone-formaldehyde resins. Also used as an active ingredient in vinyl dispersions.

**GENERAL ADVANTAGES**

Films laid down from Du Pont "Hytrol" O are easy to dry. This is important where it is desirable that there be no residual solvent to contaminate a packaged product.

At any given viscosity, more concentrated solutions of resin are possible with "Hytrol" O.

In thinner compositions of "Hytrol" O there is less change in viscosity with change in solids contents. Therefore considerable latitude in formulation and application is allowed.

To obtain full information on Du Pont "Hytrol" O, just mail the coupon below, or write us on your letterhead today.

Which of these  
other chemicals are  
you interested in?

- ☐ Adipic Acid
- ☐ Crystal Urea
- ☐ Diglycolic Acid
- ☐ HEXALIN® Cyclohexanol
- ☐ Hydroxyacetic Acid
- ☐ LOROL® Fatty Alcohols
- ☐ Methanol

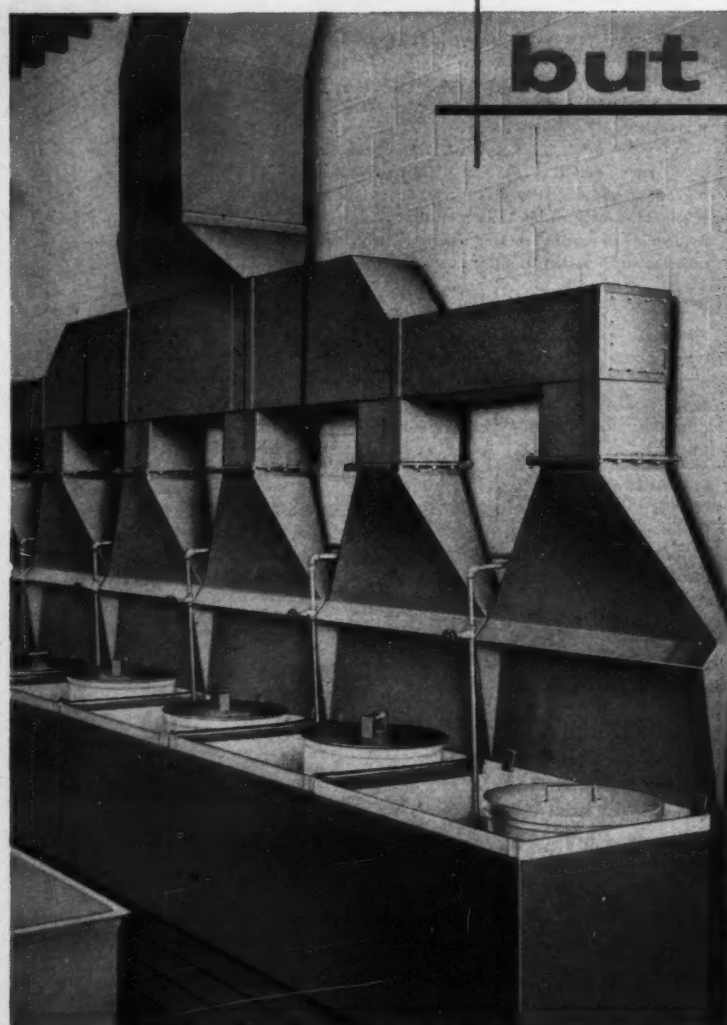
E. I. du Pont de Nemours & Co. (Inc.)  
Polychemicals Dept. 384, Wilmington 98, Del.  
Please send me full information on Du Pont "Hytrol" O cyclohexanone. I am particularly interested in using "Hytrol" O for the following applications:

Name \_\_\_\_\_ Position \_\_\_\_\_  
Firm \_\_\_\_\_  
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City \_\_\_\_\_ State \_\_\_\_\_

When inquiring check CP 4646 opposite last page

# INDUSTRY'S MOST SHOCKING WASTE...

## CORROSION COSTS EQUAL 25% OF NET PROFITS!



\*Products of Kaylor Industries, Inc., Division of Kay-Tex Mfg. Corp., Yardville, New Jersey

but

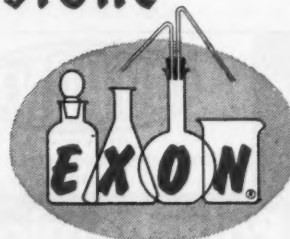
**COMCO, INC.**  
put an end to corrosion  
with EXON-based PVC!

NEW HAVEN, CONN. Venting 13,000 cubic feet of corrosive fumes per minute cost a pocketbook-frame manufacturer heavily in maintenance painting and frequent replacements. Called in to stop corrosion, Comco, Inc., New Haven, lined the tanks with VYFLEX L-10\*, a tough PVC 3/32" thick; fabricated rigid PVC flues 20' long of VYFLEX F-92\*... and wiped out his corrosion cost for good. Both lining and flues were made of materials based on Firestone Exon resins.

**You can stop corrosion!**

EXON PVC resins are the bases for a wide variety of lightweight structural rigids, linings or coatings, pipes and fittings... engineered specifically to wipe out your particular corrosion problem. To stop Industry's most shocking waste, call:

**Firestone**



**CHEMICAL SALES DIVISION**  
FIRESTONE PLASTICS CO., Dept. 68F, Pottstown, Pa.  
A Division of the Firestone Tire and Rubber Company

When inquiring check CP 4647 opposite last page

## MATERIALS

new commercial chemicals  
348-379

(Continued from preceding page)

applied. Toxicity: acute oral to male albino rats is 820 mg/kg. Stauffer.

348) **SODIUM PHYTATE** — Argo brand is a white to slightly gray, non-crystalline powder. Water soluble, it acts as complexing agent for traces of heavy metal ions. Corn Prod.

349) **SODIUM SALT OF CARBOXYLATED POLYELECTROLYTE** — Tamol 731 is 25% soln. Dispersing agent. Rohm & Haas Textile Chem Dept.

350) **SODIUM SALT OF COMPLEX SUBSTITUTED CARBOXYLIC ACID** — Emulsifier STH is rust and galvanic corrosion inhibitor. Gen. Aniline.

351) **SOLANTINE GREEN BL** — Cotton, viscose rayon, leather. Fast to rubbing, dry cleaning, light, perspiration. Bright shades. Nat'l Aniline.

352) **SOLANTINE ORANGE EGL** — Soluble direct dye, cotton, rayon. Yellow-orange. Nat'l Aniline.

353) **SOLFAST RED** — CP 1257 is a bluish shade red of 15% more strength. For inks, coatings, rubber, plastics, wallpaper. Sher-Wms.

354) **\*STEARIC ACID ESTERS OF POLYHYDROXIES** — Mollisan AS is textile lube and softener. Resists discoloration by heat. 30% conc. Onyx.

355) **\*N-STEAROYL-p-AMINOPHENOL** — Suconox-18 is a non-staining antioxidant for plastics and synthetic rubbers. MP: 131-134°. Sumner.

356) **\*STEARYL DIMETHYL BENZYL AMMONIUM CHLORIDE** — 95+-% pure. For cosmetics. LPS 4002 is non-irritating in use dilutions. Onyx.

357) **STEARYL DIMETHYL BENZYL AMMONIUM CHLORIDE PASTE** — Ammonyx 4 has 25% concentration, is stable in acid and slightly alkaline solns. Uses: cream hair rinse, pigment-wetting, chlorinated hydrocarbon emulsant, textile and paper softener. Onyx.

358) **\*STREPTOMYCIN NITRATE** — 20%. Phytomycin controls foliage diseases on fruits, tobacco. Controls black leg and soft rot of potato seed pieces. A liquid, compat. with many insecticides, fungicides. Doesn't cause chlorosis. Olin Mathieson.

359) **\*STYRENE COPOLYMER RESIN** — Plio-Tuf C75. Calendered sheets have high impact strength even at low temp; are hard, tough, chemically inert. Thermoplastic. Goodyear Chem. Div.

360) **\*STYRENE RESIN, WATER SOLUBLE** — Lustrex 710 and 770 are tackifiers for aqueous adhesives. They have excellent solvent resistance and are stable over wide pH range (1-12). Plastics Div. of Monsanto.

361) **STYRENE-BUTADIENE LATICES** — Pliolite Latex 102 and 165 are for paints, paper, textile products. 102 has high adhesion and pigment binding power, compounding and mechanical stability. 165 makes an excellent paint vehicle. Goodyear Chem. Div.

362) **SUBSTITUTED BENZOPHENONES** — Uvinuls 400, 490, D-49, M-40 are UV light absorbers for 200-400 mμ range. Uses: protective coatings. Gen. Aniline.

363) **SUCCINYL CHOLINE CHLORIDE** — USP. 98+-% on anh. basis. A muscle relaxant of low toxicity, short duration of action. Abbott.

364) **SULFUR** — 99.97% pure. Sun Oil.

365) **SURFACE-ACTIVE AGENT BLEND** — Nonionic



## MATERIALS

and anionic blend is emulsifier-coupler for polyurethane foams in 1-2½% (wt) amounts. Witco.

366) **SUPERIOR RED** — Yellow shade red of great brilliance. Economical in printing inks. Sher.-Wms.

367) **\*SYNTHETIC AND OLEORESINOUS POLYMERS COMBINATION** — EVT-50 is an emulsion vehicle for inside flat water emulsion paints. Has excellent brushing, flow, adhesion, durability. Cargill.

368) **SYNTHETIC WAX** — Advawax 280 melts at 280-290°F, is almost a powder. Internal lubricant and anti-blocking agent for vinyls, anti-tack agent with pressure sensitives, gives slip and mar resistance to lacquers. Advance.

369) **\*TALLOW ALCOHOL** — Mixed n-octadecanol and n-hexadecanol. MP: 46-47°. Has low iodine number. Uses: defoamer, emollient, intermediate for surface-active agents. Am. Alcolac.

370) **TALLOW ALCOHOL-ETHYLENE OXIDE PRODUCT** — Emulphogene AM-870 is 100%-active nonionic emulsifier with good pH and temp stability. Gen. Aniline.

371) **TETRAALKYL SILICATES** — Is base fluid for special oils, hydraulic fluids; water repellent and protective coatings; shampoo additive; plasticizers. Millmaster.

372) **\*THERMOPLASTIC RESIN** — 22% aq soln. Acrysol G-110 for thickening, warp sizing, textile finishing. Low viscosity at high solids, high viscosity at low solids. Rohm & Haas Textile Chem. Dept.

373) **THERMOPLASTIC RESIN** — 24% aq soln. Acrysol P-4 for warp sizing. Adheres to synthetic fibers. Rohm & Haas Textile Chem. Dept.

374) **\*THERMOPLASTIC RESIN DISPERSIONS** — Main use: textile finishes. Have flexibility, binding power. Rhoplex E-21 (40% solids), Rhoplex S-1 (35% solids), Rhoplex B-15 (46% solids, is also a non-woven binder), Rhoplex B-85 (38% solids, resists discoloration, also used in delustering), and Rhoplex WN-77 (50% solids). Rohm & Haas Textile Chem. Dept.

375) **THIO ORGANO-TIN POLYMERIC MATERIAL** — Advastab 50-671 is heat stabilizer for vinyls. Advance.

376) **THIOPHENE** — For use in pharmaceuticals, textile dyestuffs, agricultural chemicals, lube additives, and rubber chemicals. Purity: 98.0 mol % min. MP: -40°. BP: 83.0°. Sharples.

377) **α-THIOPHENEALDEHYDE** — 95+%. Has reactive aldehyde. Makes thiophene derivatives. Abbott.

378) **TOLYLENE DIISOCYANATE** — Mixture of 65% 2,4- and 35% 2,6- isomers for elastic and rigid foams, similar to foamed rubber. Nat'l Aniline.

379) **TOLYLENE DIISOCYANATE** — Mixture of 80% 2,4- and 20% 2,6- isomers. Versatile intermediate for elastomers, finishes, foams, Nat'l Aniline.

(Please turn to next page)

Unless otherwise specified . . .

Pressures are in mm of mercury (abs.)

Boiling points are at 760 mm

Temperatures are in °C

Solubilities are at room temperature



## These two experts can help solve your methyl chloride and methylating problems

Our Messrs. Neuville and Zellner (left to right above) cover all the bases when it comes to methyl chloride application and the special field of methylation. They come by their particular specialties honestly. Since 1936 Ansul has been a constant and expanding source of supply for bulk methyl chloride in the domestic and export markets. In the field of methylation alone (Morrie Neuville's specialty) Ansul has successfully methylated more than 100 compounds.

The methylation laboratory at Ansul is equipped to take over a methylating problem of yours at any stage of development. Manufacturing facilities for producing

commercial quantities of a methylated compound to your specification are also available.

As a major producer of methyl chloride, Ansul is prepared to supply you with quantities ranging from laboratory containers to cylinders of 100 pounds, 140 pounds, and 1,300 pounds. Tank cars of 40,000 pounds and 78,000 pounds are available. Delivery is prompt.

For general information about methyl chloride and its bulk application, write to Bob Zellner. Questions or just conversation relating to methylation should be addressed to Morrie Neuville. **THE ANSUL CHEMICAL COMPANY, DEPT. CP-4, MARINETTE, WISCONSIN.**



When inquiring check CP 4648 opposite last page



LAB

REPORT

## Odor Control in CASEIN AND ANIMAL GLUES

**Problem:** To neutralize the objectionable, characteristic odor of casein and animal glues.

**Solution:** The neutralization of the objectionable odor can be economically and effectively accomplished with special deodorant oil additives which can be used at concentrations as low as 0.3-0.5%. Sindar additives can also enhance the gummed tape, assembled container, envelope or other finished product by imparting a pleasant, sales-stimulating scent.

**SINDAR** Corporation  
Industrial Aromatics and Chemicals

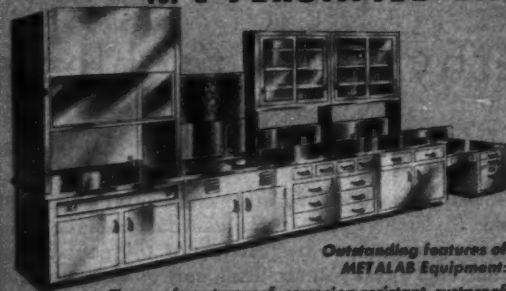
330 West 42nd Street, New York 36, N. Y.

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## METALAB

for a VERSATILE LABORATORY



Since your laboratory is a "Testing-Ground" and a source of improved processes and products, it deserves the finest equipment. Our planning service is available without any cost or obligation.

Specify METALAB and you are assured of having equipment that is completely versatile, functional, and adaptable to future operational requirements.

The equipment shown here features entire units and illustrates METALAB precision engineered interchangeable type construction.

Outstanding features of METALAB Equipment:

- Fireproof, waterproof, corrosion resistant, rustproof.
- Exclusive 8-point METCOTE protection throughout.
- Interlocked construction and double welded.
- Borderedized cold rolled furniture steel.

**METALAB** Equipment Company

230 Duffy Avenue, Hicksville, L. I., New York

- ☐ We are interested in your free planning service.  
☐ Please send us your Supplement 55-A. ☐ Please send us your 180-page Catalog 48.

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Organization \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

When inquiring check CP 4650 opposite last page

## MATERIALS

new commercial chemicals  
380-404

(Continued from preceding page)

380) **TONING RED** — Brilliant. CP 1269 has 15% more strength. Red shade has blue undertone. For plastics, inks, coatings. Sher-Wms.

381) **TONING RED AMINE** — Brilliant. CP 1204 is intermed. for azo pigment colors, with good heat and light resistance. Sher-Wms.

382) **TRICRESYL PHOSPHATE** — Cabflex® TCP is based on petroleum cresylic acid. A plasticizer for vinyl resins, nitrocellulose, and other plastics. Has outstanding electrical properties. Combined with esters based on oxo process alcohols, it stabilizes them against oxidation. Cabot.

383) **TRIETHANOLAMINE** — Intermed. for emulsifying soaps. Solvent for rubber, resins. Nitrogen-Allied.

384) **TRIETHANOLAMINE DODECYL BENZENE SULFONATE** — Ninex 300 is a 60% aq soln of this compound. Uses: liquid detergents and as wetting agent. Has high foam, good viscosity on dilution. Ninol.

385) **TRIETHYL MONOMETHYL DIACETAL MALONALDEHYDE** — 99+%. Cross-linking, insolubilizing agent. Pharmaceutical, general intermed. Kay-Fries.

386) **\*TRIETHYLENE GLYCOL DIPELARGONATE** — Plastolein 9404 TGP is tech grade. As synthetic rubber plasticizer, it is economical, has good low temp flex, low heat loss, low water sensitivity, low compression set. Pour point is <20°. Emery Ind.

387) **TRISOCTYL PHOSPHITE** — Auxiliary stabilizer for vinyl resins. BP (15 mm): 226-235°. Mill-master.



Ten dollars to Stewart Fisher for this cartoon. Stewart hails from South Bend, Ind., works there for U. S. Rubber.

If you have a cartoon idea, see notice on page 23. It could mean money for you!

Why let foam  
**HOG**  
your profits?



## use DOW CORNING Silicone Defoamers

The most versatile and efficient foam killers ever developed, they increase your productive capacity; reduce processing time; eliminate the waste and fire hazard of boil-overs.

In the **PROCESS INDUSTRIES**, including textiles, paper, rubber and specialty chemicals, foam is killed with Dow Corning Antifoam\* A Emulsion, or with Dow Corning Antifoam A Compound as a solvent dispersion or mixed with an ingredient of the foamer.

In **FOOD PROCESSING** foam is controlled with Dow Corning Antifoam AF Emulsion, permissible at concentrations up to 34 ppm or, with Dow Corning Antifoam A at concentrations up to 10 ppm.

### EFFECTIVE AT LOW CONCENTRATIONS

For example, you need only:  
1 oz. Antifoam A Compound in 62,500 lbs. of 70% caustic liquor.

1 oz. Antifoam AF Emulsion in 2,075 lbs. chocolate syrup.

### TEST THEM FREE!

Mail coupon today  
for sample

DOW CORNING  
SILICONES

Dow Corning Corporation  
Midland, Mich., Dept. 3204

Please send me:

- ☐ Booklet on Silicone Defoamers; FREE sample of ☐ Antifoam A Compound  
☐ Antifoam A or ☐ AF Emulsion

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COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

\* T.M. REG. U.S. PAT. OFF.

When inquiring check CP 4651  
opposite last page

CHEMICAL PROCESSING

## MATERIALS

388) \*TY-PLY RC, BC — Cover coat adhesives for natural synthetic rubber. Versatile. Marbon.

389) \*TY-PLY UP — Metal primer for rubber-to-metal vulcanized bonding. Levels erratic adhesions. Marbon.

390) UREA PELLETS — Intermediate for resins, nitrogen source. Easy handling. Nitrogen-Allied.

391) UREA-AMMONIUM NITRATE SOLNS — Urea for fertilizers. Various proportions. Nitrogen-Allied.

392) \*UREA-FORMALDEHYDE, ETHER MODIFIED — Formaset LC-1. Highly polymerized, durable stiffening agent for textile finishes employing urea-formaldehyde resin. 50% active. Warwick.

393) \*UREA-FORMALDEHYDE FERTILIZER — Resin has added plant nutrients, is 45% active. Liquid application with slow N release. Warwick.

394) \*UREA-FORMALDEHYDE FERTILIZER — Resin is for dry application, has slow N release. Urea-form (SWT) is 95% active. Warwick.

395) \*UREA-FORMALDEHYDE RESIN — Modified resin for textile finishing. Prym E gives crush resistance and dimensional stability. Wash fast. Warwick.

396) URETHANE FOAMS — Components to make these foams. Mobay.

397) \*VEGETABLE GUMS, AQUALIZED — Aquacels, No. 200 Series, are instantly soluble gums for use as vehicles for insecticides, fungicides, and herbicides. They give longer residual effect, have porous breathing film. Non-toxic. Soluble Prod.

398) VERSALIDE — A musk product for perfumes, cosmetics, soaps.  $C_{12}H_{22}O$  has MP: 45°, BP: 130° @ 2mm. Colorless cryst. Stable. Givaudan.

398A) \*VITAMIN A PALMITATE — Vapad is equilibrium mixture of all-trans and neovitamin A palmitates. Has not less than 1,000,000 USP units/gm. Improved stability. For multivitamin aq dispersions. Pfizer.

399) \*WEAK BASE ANION EXCHANGE RESIN — Duolite A-114 for demineralization, acid removal, color refining. Resin is in bead form, has high porosity, high capacity. Tech grade. Chem. Process Co.

400) \*m-XYLENE — 95+ % pure, for making pharmaceuticals, dyes, synthetic musks, industrial chemicals. BP: 139°. Oronite.

401) ZINC OXIDE PELLETS — Helps reduce handling, storage, processing costs. N.J. Zinc.

402) \*ZINC o-BENZAMIDOTHIOPHENATE — Low temp plasticizer for rubber. Am Cy.

403) \*ZINC SALT OF ALKYL N-PROPYLDIAMINE PENTACHLOROPHENATE — Phenamin Zinc Super-Resin is stable preservative with high fungicidal activity. Won't change color or cause discoloration or aging. Low toxicity. Water emulsifiable. 92% active. By-Products.

404) ZINC SULFIDE, PHOSPHORESCENT — Violite Phosphorescent Pigment No. 199, green, is used in plastics and paints which "glow in the dark." R.I. Labs.

Please turn to page 64 for the beginning of the listing of Developmental-scale materials made available during 1955

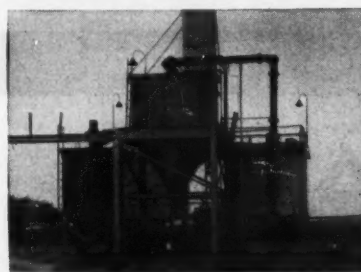


Better flavor, better health in every bite\*\*... thanks, in part, to Monel.

## New table salt supplies vital "trace" nutrients

### Made directly from sea water in Monel-protected equipment

Nearly everyone is familiar with the use of iodine to prevent goiter... fluorine to stop tooth decay... iron to overcome anemia.



Heat and motion complicate salt corrosion problem in evaporator (elevated) and slurry (left) tanks at Trace Element Corp. plant. Monel protects both tanks and their interior processing equipment as well.

\*Registered trademark

\*\*For more information on Trace Element Sea Salt, write Trace Elements Corporation, 718 N. Drennon St., Houston, Texas.

Experts now say other elements in trace quantities may prove equally vital to health. Copper, cobalt, magnesium, manganese, zinc, molybdenum and others.

A new type of salt—"Admiral" Trace Element Sea Salt contains these "micro-nutrients." Prepared for table and cooking use, it can supply them pleasantly in called-for quantities.

Hence an interesting new plant 35 miles south of Corpus Christi, Texas. Here, Trace Elements Corporation produces free flowing table salt containing 75% NaCl and 25% other minerals from sea water.

### Avoids equipment corrosion problems

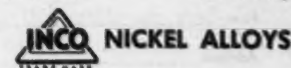
In designing the new plant, engineers faced two potentially serious corrosion problems... attack on interior surfaces of equipment by the highly saline

stream... and attack on exterior surfaces of equipment by salt-laden offshore breezes.

Use of Monel\* nickel-copper alloy in the more critical pieces of the plant's equipment avoids both hazards. Monel alloy is used for the evaporator tank and its submerged combustion unit... for slurry tank, mixer shaft and impeller blades... for surfaces in contact with salt in the rotary dryer and cyclone dust collector... for all pump impeller housings... and other items.

If corrosion by salts is troublesome to you, Monel, nickel, or one of the other nickel alloys may cut your problem down to size. To look into the matter, simply write:

THE INTERNATIONAL NICKEL COMPANY, INC.  
67 Wall Street New York 5, N. Y.



Monel... for minimum maintenance

When inquiring check CP 4652 opposite last page



Ester manufacturers! You want  
color stability—and here it is!

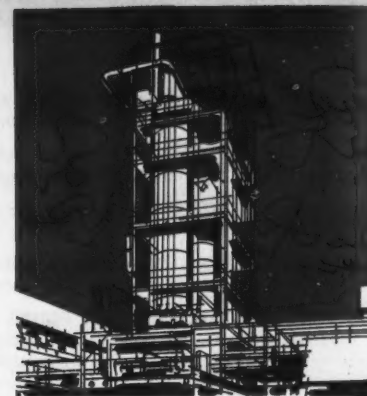
.....**Even at highest  
temperatures—Neo-Fat®  
stearics show  
minimum color change!**

The light color esters you produce must *keep* their color, and not break down or develop odors even under high temperature processing. And tests prove that double and triple pressed Armour Neo-Fat Stearic Acids have superior color stability—and superior stability to *heat, light* and *oxidation*.

In a series of comparative processing tests, esters prepared from Neo-Fat Pressed Stearics showed a minimum color change. The peroxide index, measuring the amount of oxygen absorbed, also remained constant. Even after a year of storage, Armour Pressed Stearics show no odor development—no breakdown due to rancidity. This superior stability, plus the lighter initial color of Armour Stearics means higher quality esters for you. The guaranteed constant composition of Armour Stearics means your esters will maintain their uniform, superior quality.

Start insuring this quality in your esters by using Armour Neo-Fat Stearic Acids. Send the coupon for information and samples today!

**ARMOUR—your one best  
source for all fatty acids**



**Only Armour's  
2-system  
Fractionation**

can supply you with such  
a complete line of  
highest purity fatty acids  
tailored for ester manufacturing.

Only Armour uses fractional distillation and solvent crystallization to produce a complete line of uniform Neo-Fat fatty acids offering single components in purities as high as 96%. *Yet you pay no premium in price.* Advantages such as these make Armour your *one* best source for all fatty acids. In the list below, you'll find the specific Armour Neo-Fats that will help you produce the finest esters at the lowest cost. Write us for samples and information.

**PRESSED STEARIC ACIDS**

Neo-Fat 18-54 Double Pressed  
18-55 Triple Pressed

**SPECIALTY COCO ACIDS**

Neo-Fat Commercially Pure Caprylic  
10 Commercially Pure Capric  
12 Commercially Pure Lauric  
14 Commercially Pure Myristic  
265 Double Distilled Coco  
Plus tailored blends of coco fractions

**SPECIALTY PALMITICS AND  
STEARIC ACID**

Neo-Fat 16 Commercially Pure Palmitic  
16-54 70% Palmitic  
18 Commercially Pure Stearic  
18-57 65% Stearic  
18-58 70% Stearic  
18-61 80% Stearic

**OLEIC ACIDS**

Neo-Fat 92-04 Low Titer White Oleic  
94-04 Low Titer Red Oil  
94-10 High Titer Red Oil

**MAIL THIS COUPON TODAY!**

Please send me:

- ☐ Specifications Chart  
☐ Sample of Neo-Fat 18-55 (triple pressed)  
☐ Sample of Neo-Fat 18-54 (double pressed)

Name \_\_\_\_\_

Title \_\_\_\_\_

Firm \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

CP4



**ARMOUR  
CHEMICAL  
DIVISION**

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1355 West 31st Street • Chicago 9, Illinois

When inquiring check CP 4653 opposite last page



B

ORON-containing chemicals

have risen in importance in recent years. One reason is their use in atomic energy as neutron absorbers. A second is the discovery by the chemical processing industries that these boron compounds have other interesting properties. A series of seven compounds based on methyl borate has just been introduced. Although this article suggests some applications, these should by no means be considered exhaustive, because of the fast-expanding field of —

PROPERTIES OF BORON COMPOUNDS

Compound	Formula	Mol. Wt.	Color	State	MP (°C)	BP (°C)	Other Properties
Methyl Borate-ammonia	$(\text{CH}_3\text{O})_2\text{B}\cdot\text{NH}_3$	120.95	white	cryst.	45°	(sublimes)	
Trimethoxyboroxine	$(\text{CH}_3\text{O})_2\text{B}_2\text{O}_3$	173.56	colorless	liquid	11°	150° (d)	density: 1.2 gm/ml
N,N',N''-Trimethyl-borazine	$(\text{CH}_3)_3\text{N}_3\text{B}_3\text{H}_3$	122.61	colorless	liquid	-9°	134°	
Dimethylamine-borane	$(\text{CH}_3)_2\text{NH}\cdot\text{BH}_3$	58.93	white	cryst.	36°	59-65° (1-2 mm)	
Trimethylamine-borane	$(\text{CH}_3)_3\text{N}\cdot\text{BH}_3$	72.96	white	cryst.	94°	171°	
Pyridine-borane	$\text{C}_5\text{H}_5\text{N}\cdot\text{BH}_3$	95.97	colorless	liquid	10-11°	65° (1 mm)	refractive index: 1.5200 (25°C)
Pyrrolidine-borane	$\text{C}_4\text{H}_8\text{NH}\cdot\text{BH}_3$	84.97	white	cryst.	80-82° (d)	—	

## ORGANO-BORONS:

### Seven Newcomers to a Growing Field

Preliminary studies of a recently introduced series of boron compounds indicate that they will find use as intermediates, selective reducing agents, catalysts, fungicides, fluxes, and as extinguishers for active metal fires. The pharmaceutical and plastics industries will probably find them of most value.

**Methyl borate ammonia**—A volatile flux for soldering, brazing, or welding, its vapors are conveniently transported to the torch in the fuel gas. It is also a fungistatic agent, preventing mold on picked citrus fruit.

The crystalline complex sublimes at 45°C at atmospheric pressure. It hydrolyzes and is slightly soluble in methanol and mineral oil.

**Trimethoxyboroxine** Although this liquid burns, its combustion product is a glassy boric oxide which can smother magnesium, sodium, and sodium-potassium alloy fires. It is also a source of boric oxide in solution. An organic with very high boron content, it should find application as a neutron absorber. The liquid hydrolyzes in water, and is miscible with

methyl borate, methanol, acetone, benzene, and dioxane.

**N,N',N''-Trimethyl-borazine**—A fungicide or germicide, a specialty reducing agent, a neutron absorption medium, this compound is more stable to water than its parent chemical borazine. The borazines are characterized by a ring of alternating boron and nitrogen atoms. Borazine is sometimes referred to as "inorganic benzene," to which its properties are strikingly similar.

Trimethylborazine is immiscible with water and reacts with methanol and acetone. It is completely miscible with benzene, dioxane, and ether.

**Dimethylamine-borane** — Potential use as an intermediate in preparation of organo-boron compounds is seen. It is a selective reducing agent for saturated and unsaturated carbonyl compounds, especially in non-aqueous solvents. It should find application in research laboratories and in the pharmaceutical industry.

It attacks an aldehyde group while leaving double

bonds unaffected. For example, citronellal can be reduced in 74% yield to the unsaturated alcohol, which is an essential oil for perfume and flavoring. Dimethylamine-borane is soluble in both water and organics. It hydrolyzes very slowly in neutral or alkaline solution at low temp, and therefore can even be used in aqueous solution with little loss.

**Trimethylamine-borane** — A specialty reducing agent for organic reactions, this derivative is highly soluble in ether and benzene and moderately soluble in water and hexane.

**Pyridine-borane** — This compound is a specialty reducing agent for organic compounds or metals. It reduces ferric salts to ferrous, silver salts to the metal, and iodine to iodide in aqueous solution. The colorless, low-viscosity liquid slowly darkens on standing. It is very soluble in ether, alcohol, or pyridine, and is slightly soluble in water or hexane.

**Pyrrolidine-borane** — This is another specialty reducing agent for organics. It's highly soluble in water, in which it hydrolyzes, and in benzene. It is moderately soluble in ether, and slightly soluble in hexane.

The first two compounds in this article are available commercially. The last five are available in research quantities.

(Boron chemicals are products of Callery Chemical Co., Dept. CP, Callery, Pa. . . or for more information check CP 4654 on form opp. last page.)

# developmental-scale chemical materials



... made available in 1955

Chemical materials made available on a developmental, pilot plant, or semi-works scale last year are described in this list.

An asterisk denotes products that manufacturer states were not available to industry prior to the time he introduced his product, or which had special characteristics not available before that time. Those not marked were previously available, but not from the company indicated.

†Commercially available chemical materials are listed starting on page 34.

If you would like additional information on any item, contact manufacturer. Full names and addresses are on page 82.

In looking for materials for specific uses, you'll find it more convenient to first see our "Use-Index," page 32, which is cross-indexed with this list. Find what you want there, then check this list for items with numbers over 500.

501) ACETYLATED MONOGLYCERIDES — Myvacets are free from greasiness, safe for cosmetic uses. Come in solid and liquid form. DPI.

502) 4-n-ALKYL PYRIDINES — 95+% purity. Alkyl group ranges from  $C_4$  to  $C_{10}$ . Possible applications: in surface activity and acid inhibition, as intermediate for hydraulic fluids and plasticizers. Ansul.

503) \*ALKYAMINE ALKYL ARYL SULFONATE — Ninate 430 has mw about 480. A 60% soln in oil, it's used as rust inhibitor and emulsifier in protective oils, corrosion inhibitors. Ashless. Ninol.

504) \*ALLYL CROTONATE — A comonomer with unsaturates; a crosslinking agent in making copolymers. Min purity: 95%. Toxic. Jasonols.

505) \*AMINOETHYL PIPERAZINE — BP: 221°. For pharmaceuticals, germicides, polyamide resins and fibers. Carbide & Carbon.

506) 3-AMINO-1-PROPANOL — Pract. MP: 10-12°. DPI

507) AZOBENZENE — 95% min purity. Uses: insecticide, making dyestuffs, as flotation reagent. MP: 68°. BP: 293°. Eastern.

508) 3-BENZOYLACRYLIC ACID — Pract. DPI.

509) BENZYL SUCCINATE MONOSODIUM SALT — DPI.

510) 4,4'-BIS(4-AMINO-1-NAPHTHYLAZO) 2,2'-STILBENEDISULFONIC ACID — pH indicator, changes color at pH 8.2. Easily observed. DPI.

511) BIS( $\alpha$ -METHYLBENZYL) ETHER — Pract. DPI.

512) 3,3'-BITOLYLENE 4,4'-DIISOCYANATE — Slow reacting at room temp, extends life of uncured elastomers, potting compounds. Nat'l Aniline.

513) BIURET — Blowing agent, herbicide, resin intermediate. Nitrogen-Allied

514) \*BLUE TETRAZOLIUM — An oxidation-reduction indicator for research in enzymes, carbohydrates. Reduces enzymes, carbohydrates, cortico-steroids. Exp. Dajac Labs.

515) \*BUTANEDIOL DICRAPYLATE — Ca. 98% pure.  $(CH_2)_2(CH_2OCOC_6H_5)_2$ . Called BD-8, it is plasticizer for natural and synthetic rubbers, having superior low-temp performance. Rubber Corp.

516) n-BUTYL MERCAPTAN — For use in organic synthesis, rubber, agricultural, and mining chemicals. Purity: 98%. BP: 97.4-98.4°. Sharples.

517) 2-n-BUTYLAMINOETHANOL — Pract. DPI.

518) \*1-n-BUTYL-3-(3,4-DICHLOROPHENYL)-1-METHYLUREA — Crabgrass and Chickweed Preventer has 18.5% active ingredient. DuPont Grasselli.

519) n-BUTYLUREA — Modifies urea-formaldehyde resins. 99% pure. MP: 94-96°. Exp. Eastern.

520) CADMIUM SALICYLATE — Pure white needles. Antiseptic properties. City Chem.

521) \*CALCIUM CHROMATE — Anhydrous. Purity: 96% min, for corrosion inhibition, batteries. Limited chromate solubility. Mutual.

522) CALCIUM TETRAPHOSPHATE — Pure. City Chem.

523) CALCOZINE NEW FUCHSINE L — Basic dye for paper, leather, lakes. Am Cy.

524) \*2-CHLORALLYLIDENE DIACETATE — BP (100 mm): 147.5°. Gives heat distortion resistance, good color and processing properties to vinyl chloride copolymers. Exp. Carbide & Carbon.

525) \*CHLORINATED HYDROCARBON RESIN — Uses: as flame retardant, extender, filler, and in coatings, insecticides, textiles, plastics, rubber, insulators. Light colored powder contains 60-70% chlorine, has excellent heat stability at 180°. Sol: aromatics, chlorinated hc's, esters, cyclohexanone. Insol: alcohols, paraffins, acetone. Neville Chem.

526) \*CHLORINATED POLYETHERS — Penton molding powder for injection and extrusion molded thermoplastics. Hardens by crystallization rather than sole removal of heat. This eliminates all strain within molded piece. Water absorption is 0.01%, so dimensional stability is excellent. Hercules.

527) p-CHLORO-m-CRESOL — Chlorocresol is external germicide, preservative. Chemo Puro.

528) 2-CHLORO-4-NITROPHENOL — 95+% Agri-cultural chemical intermediate. MP: 111°. Exp. Dow.

529) p-CHLOROPHENYL-GLYCERYL ETHER — Chlorophenesin is external antiseptic, preservative. White powder. Chemo Puro.

530) COBALTOUS FORMATE — Pure powd. City Chem.

531) CUPFERRON — For uranium assay. Arapahoe.

532) \*CYANATEX DYEING ASSISTANT EM — For Dacron, acetate, nylon. Am Cy.

533) CYCLICIZED RUBBER — Use in varnishes, paints, coatings. Acid, alkali resistant. Alkydol Labs.

534) \*CYCLOHEXENEACETIC ACID — Pharmaceutical intermediate. Has properties of  $\beta$ -unsaturated carboxylic acid. Sets: 23.5°. Exp. Arapahoe.

535) CYCLOHEXYLUREA — Modifies urea-formaldehyde resins. 99% pure. MP: 190-192°. Exp. Eastern.

536) CYCLOPENTENE — BP: 43-44°. Arapahoe.

537) CYCLOPENTYLPROPIONIC ACID — For making esters for pharmaceuticals and perfumes. Exp. Arapahoe.

538) \*DECANALS — Branched-chain  $C_{10}$  aldehydes boil 190-210°. For making high mw amines for inhibiting corrosion; intermediate. Carbide & Carbon.

539) \*DECANOIC ACIDS — Mixture of branched-chain  $C_{10}$  acids boiling 100-120° @ 1 mm. Makes paint driers of improved hydrocarbon solubility, plasticizers. Ba salt suggested as stabilizer for vinyl chloride resins. Carbide & Carbon.

540) \*DECYL ACRYLATE — BP (50 mm): 158°. For Polymers, copolymers with vinyl acetate and ethyl acrylate for latex paints, adhesives, textile finishes; VI improvers; lube oil additives. Carbide & Carbon.

541) DIACETYLAMINOAZOTOLUENE — In ointments and dusting powders to stimulate healing of wounds in veterinary medicine. MP: 75°. Exp. Eastern.



542) \*DIALKYL METHYL TERTIARY AMINES —  $R_2NCH_3$ , where R is hydrogenated tallow (Armeen M2HT), coco (Armeen M2C), or soya (Armeen M2S). Lube oil additive. Intermediate for salt-free quaternaries, germicides. Feature: oil solubility. Armour Chem. Div.

543) \*DIALYL DIGLYCOLLATE — A crosslinking agent in copolymers, a comonomer with unsaturates. Purity: 95% min. BP @ 4mm: 130-135°. Jasonols.

544) DIAMINO DIPHENYL SULFONE — Comonomer. Gives high temp resistance to epoxies. Monsanto.

545) \*DIAMYL AMINES — Mixture of secondary amyl amines boiling at 190°. An extraction solvent. Makes rubber accelerators, cleaning compounds, corrosion inhibitors, flotation agents. Carbide & Carbon.

546) \*DIBENZYLPIRROLE — Carbazole is a high purity material made by coal hydrogenation process. BP: 354.8°. In making dyestuffs, insecticides, plastics. Carbide & Carbon.

547) N,N-DIBROMOBENZINESULFONAMIDE — Dibromamine B is an oxidizing and brominating agent. Arapahoe.

548) DIBUTYL ISOSEBACATE — A low temp plasticizer for vinyl and cellulose resins, it has relatively low volatility. BP @ 4 mm: 179-183°. Kessler.

549) \*DI-n-BUTYL ITACONATE — 99+%. BP: 145°. For synthetic fibers, plasticizers, monomeric resins and plastics. Pfizer.

550) 3-DI-n-BUTYLAMINOPROPYLAMINE — Curing agent, epoxy resins. Am Cy.

551) \*1,4-DICHLORO 2,3-EPOXY BUTANE — BP: 192°. Reactive intermediate. Exp. Carbide & Carbon.

552) \*N,N-DICHLORO p-TOLUENE SULFONAMIDE — Active chlorine releasing agent. 99.7%. Monsanto.

553) N,N-DICHLOROBENZENESULFONAMIDE — Dichloramine B is oxidizing and chlorinating agent. Exp. Arapahoe.

554) cis-1,2-DICHLOROETHYLENE — BP: 59-60°. DPI.

555) trans-1,2-DICHLOROETHYLENE — BP: 48-50°. DPI.

556) \*2,3-DICHLOROHEXAFLUOROBUTENE-2 — Coolant, makes plastics, refrigerants, coatings. 95+% pure. Double bond is of interest. BP: 67°. Exp. Hooker.

557) \*1,2-DICHLOROHEXAFLUOROCYCLOPENTENE-1 — 95+%. a coolant, dielectric. Makes elastomers, polyester resins, wetting agents. BP: 90°. Exp. Hooker.

558) \*N,N'-DICYCLOHEXYLCARBODIIMIDE — 99.9+%. Gives high yields of amides from free acids and free amines MP: 33°. No known toxicity. Aldrich.

559) \*DICYCLOPENTADIENE —  $C_{10}H_{12}$ . For prep of alkali metal derivatives and dibasic acids. As intermedi-

(Please turn to next page)

Unless otherwise specified . . .

Pressures are in mm of mercury (abs.)

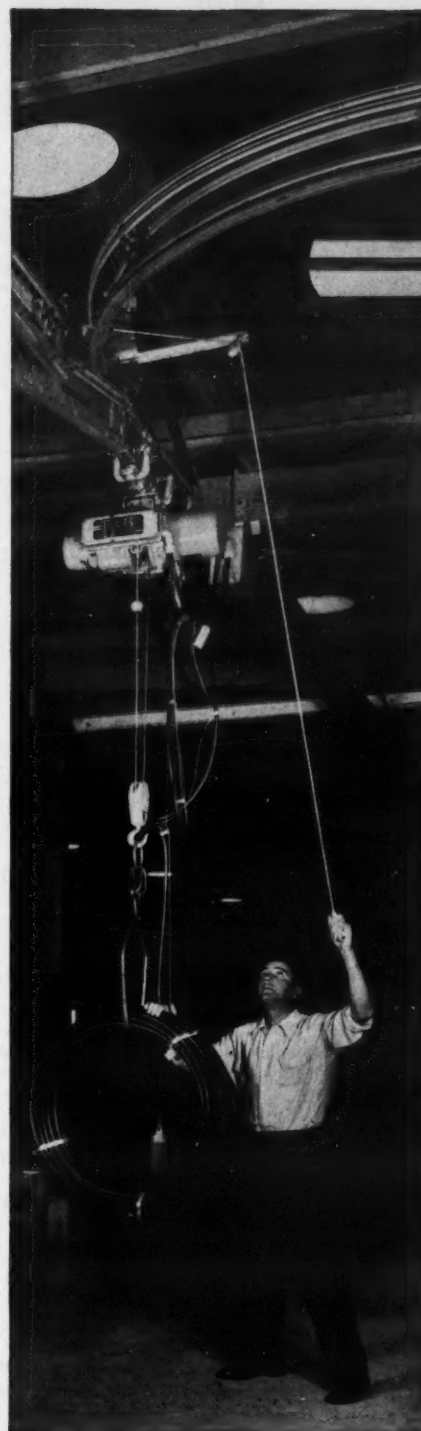
Boiling points are at 760 mm

Temperatures are in °C

Solubilities are at room temperature

Another new development using

# B. F. Goodrich Chemical raw materials



B. F. Goodrich Chemical Company does not manufacture this extrusion. We supply only the Geon rigid vinyl materials.

## Rigid Geon packs power in small space

NAKED wires on an overhead power lift are a hazard, lose power along the line and have to be spaced widely where multiple electrical contacts are needed in large plants. As a product improvement, a manufacturer has designed U-shaped extruded insulation made of Geon rigid vinyl that has many advantages for the job.

The rigid vinyl extrusion carries a metal contact conductor safely so that as many as three to twelve power lines can be installed close together where space is tight. Because this insulation is made of Geon rigid vinyl it has high dielectric strength, high insulation resistance with low power loss. It has good chemical and abrasion resistance, necessary for long life in industrial plants and it can be colored according to local code requirements.

This installation you see here is a good example of a new use for Geon rigid vinyl. It may suggest a new use to you or may give you an idea for another saleable product. There are scores of other uses for Geon materials from rigid sheeting to rigid pipe and fittings. For technical help in the uses of versatile Geon please write Dept. DD-2, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

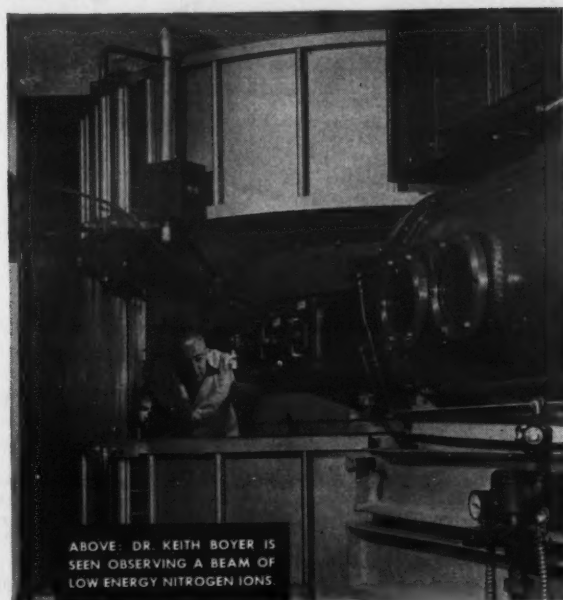


GEON RESINS • GOOD-RITE PLASTICIZERS . . . the ideal team to make products easier, better and more saleable.  
GEON polyvinyl materials • HYCAR American rubber and latex • GOOD-RITE chemicals and plasticizers • HARMON colors

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# BASIC RESEARCH at los alamos



ABOVE: DR. KEITH BOYER IS  
SEEN OBSERVING A BEAM OF  
LOW ENERGY NITROGEN IONS.

The cyclotron shown above is one of the many types of advanced research equipment in use at Los Alamos. This variable energy machine is designed to accelerate high intensity beams of all the hydrogen and helium isotopes.

The Laboratory offers a wide range of opportunities to do research and development work in the fields of Physics, Chemistry, Metallurgy, Mathematics, Computing and Engineering.

If you are interested in learning more about career opportunities at Los Alamos, write—

DEPARTMENT OF SCIENTIFIC PERSONNEL  
Division 702

los alamos  
scientific laboratory  
OF THE UNIVERSITY OF CALIFORNIA  
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## MATERIALS

new developmental chemicals  
560-571

(Continued from preceding page)

ate for polyesters, alcohols, resins. High purity (95%), versatile reactivity, low sulfur content, potential low cost. MP: 33.6°. BP: 170°. Enjay.

560) \*DIDECYL AMINES — Mixture of secondary decyl amines boiling 130-160° @ 1.5 mm. For making ore flotation compounds, surface-active agents, corrosion inhibitors. Exp. Carbide & Carbon.

561) DIETHYL ADIPATE — A plasticizer and an intermediate in organic synthesis. Compound has 99% purity, and is compatible with many resins. MP: -21°. BP: 239°. Eastern.

562) \*DIETHYLAMINOETHOXYETHANOL — Intermediate for pharmaceutical and organic chemicals. 98% pure ( $C_2H_5)_2NC_2H_4OC_2H_4OH$ . BP: 215-225°. Sharples.

563) \*DI-2-ETHYLHEXYL ISOSEBACATE — Plasticizer has low volatility, low-temp properties, low water extraction, low relative cost. BP @ 4 mm: 221-223°. Kessler.

564) 4,5-DIHYDROXY-m-BENZENEDISULFONIC ACID DISODIUM SALT — Sensitive reagent for Fe and Ti. DPI.

565) DIISOAMYL HYDROGEN PHOSPHATE — BP: 121-124° @ 8 mm. Antiwear oil additive. Exp. Millmaster.

566) DIISOBUTYLENE OXIDE — Mixed isomers boiling 140.3°. Acid acceptor, epoxide polymerization, epoxy resin diluent. Makes insecticides, surface-active agents. Exp. Carbide & Carbon.

567) DIISOCYANATE DERIVATIVE — DMDI, slow reacting isocyanate for textile finishes, curing agent for polyurethane rubbers. National Aniline.

568) DIISOPROPYLAMINOETHANOL — 98% ( $C_3H_7$ )<sub>2</sub>NC<sub>2</sub>H<sub>4</sub>OH. BP: 190°. Pharmaceutical intermediate. Sharples.

568A) \*DIMETHYL ITACONATE — 99+%. BP (10 mm): 91.5°. For synthetics, fibers, plasticizers, monomeric resins and plastics. Pfizer.

569) 2,5-DIMETHYL PIPERAZINE — MP: 115.5°. For modification of polyamide fibers and resins. Making pharmaceutical intermediates and vermifuges. Carbide & Carbon.

570) \*3,5-DIMETHYL PYRIDINE — BP: 171°. Ansul.

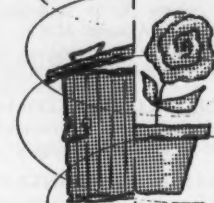
571) DIMETHYL SULFOXIDE — BP: 189°. Water-sol liquid dissolves many organics, is selective in its hydrocarbon solubility characteristics. Potential use as antifreeze, hydraulic fluid. Non-toxic in preliminary tests. Stepan.

(Please turn to page 68)

THE QUICK WAY to pin-point a chemical material for a specific application is to use the "Use-Index" on page 32.

MANUFACTURER ADDRESS LIST starts on page 82. Contact them for additional details.

## WHAT KIND OF



## Atmosphere DOES YOUR SPACE DEODORANT CREATE?

This is not a facetious question... rather a very sales-serious one. Impressions are created by our senses and retained in the memory often long after the sharpness of actual events have faded. The space deodorant that scents a theater, hotel, restaurant, lobby, factory or home is quietly and unobtrusively making either pleasant or unpleasant associations in the minds of your customers. If the masking and and reodorizing agent has been carefully selected after exhaustive developmental work in an Aerosol Testing Laboratory... chances are excellent that your "silent salesman" is making friends. Such a service is available to you in the D&O Aerosol Department. Let our Aerosol Technicians and expert perfumers help put the *right atmosphere* in your space deodorant!

"Essentially for you"



OUR 157th YEAR OF SERVICE

**DODGE & OLCOTT, INC.**  
180 Varick Street • New York 14, N.Y.  
SALES OFFICES IN PRINCIPAL CITIES

Perfume Bases • Flavor Bases  
Essential Oils • Aromatic Chemicals  
Dry Soluble Seasonings

When inquiring check CP 4656  
opposite last page

CHEMICAL PROCESSING

**Give increased viscosity  
to water solutions  
without heating . . .**

series of water-soluble gums  
is white, free-flowing

**Uses:** As a protective colloid,  
thickening, suspending, and film  
forming agent.

**Features:** All gums of series  
are white, free-flowing powders  
readily soluble in cold water.  
Solutions are clear, virtually color-  
less, tasteless, odorless, and non-  
toxic.

**Description:** Gums are ex-  
tracted from seeds of cyamposis  
tetragonoloba and similar seed  
pod plants. Water solutions are  
formed by sifting into water  
under brisk agitation. Normal  
viscosity develops without heat  
within 30 min of initial dispersion.

Average moisture content of ma-  
terial is from 9 to 11%, pH de-  
pends on grade, 6.8 to 7.5.

(Series 7 gums are products of  
The Burtonite Co., Dept. CP,  
Hamilton Place, Nutley 10, N.J.  
. . . or for more information  
check CP 4657 on form oppo-  
site last page.)

**Lists reactions, toxicity  
of cyclohexanol**

Reactions of cyclohexanol, in-  
cluding ester formation, dehy-  
dration, and oxidation, are part  
of information contained in two-  
page technical data sheet. Major  
uses, general physical data, and  
shipping information are also  
given.

"Cyclohexanol" is issued by  
Organic Chemicals Div., Mon-  
santo Chemical Co., Dept. CP,  
800 N. Twelfth Blvd., St. Louis  
1, Mo. When inquiring specify  
CP 4658 on form which is lo-  
cated opposite last page.

For more information on prod-  
uct at right, specify CP 4659  
. . . see information request  
blank opposite last page.

FAMOUS LIGHTHOUSES OF AMERICA



*STANNARD ROCK LIGHTHOUSE, Lake Superior, Michigan, is located  
about 23 miles southeast of Manitou Island. Completed in 1883, the stone tower  
is built on a base of concrete and stone which stands on solid rock  
in 11 feet of water. The light, 102 feet above water and  
visible for 18 miles, protects shipping in a dangerous area on the  
heavily traveled trade route between Duluth  
and the lower lakes.*

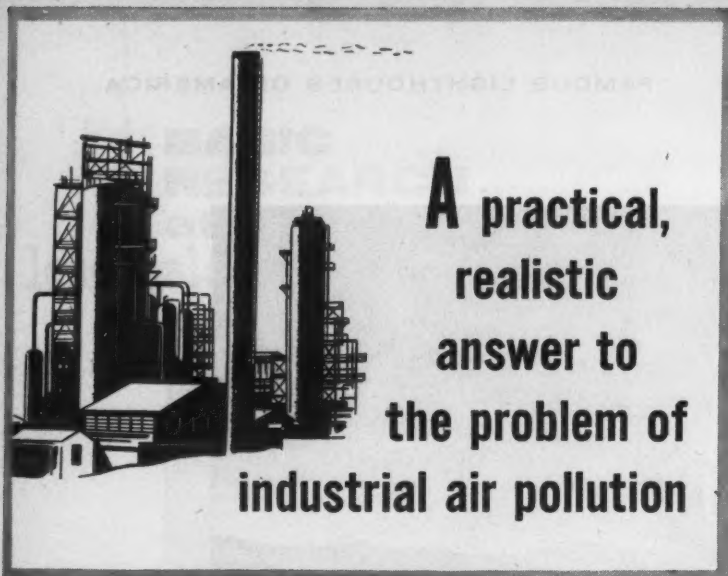
*Protection* for the quality of your products and the efficiency of your pro-  
cesses is provided by the uniformly high standards of Niagara Alkali and the  
Hooker Electrochemical Company's years of experience. Depend on the purity  
and uniformity of Nialk® Caustic Potash, Carbonate of Potash, Trichlorethylene,  
Niagathal® (Tetrachloro Phthalic Anhydride).

**NIAGARA ALKALI DIVISION**  
HOOKER ELECTROCHEMICAL COMPANY

4728 Buffalo Avenue, Niagara Falls, New York

**HOOKER  
CHEMICALS  
& PLASTICS**





## A practical, realistic answer to the problem of industrial air pollution

**Catalytic oxidation can now eliminate  
objectionable fumes and odors from your stack exhausts  
effectively, efficiently — and often at an actual saving  
— with the use of Houdry Oxycats**

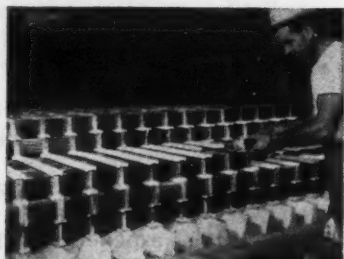
Properly engineered to your individual requirements, Houdry catalytic installations can eliminate, or reduce below objectionable levels, harmful and irritating fumes and odors in an exhaust stream.

These Oxycat installations are working effectively for a wide range of industries where combustible and organic pollutants are present, including solvents, phenols, formaldehyde, phthalic anhydride, polyethylene and carbon monoxide. Oxycats can also be used to oxidize  $H_2S$  and organic sulfides and to reduce oxides of nitrogen. And in many cases the heat released by the oxidation process will result in important fuel savings.

The key to any successful catalytic installation, of course, is the catalyst itself. Oxycats have an outstanding advantage in their exceptionally long life at high efficiency. There's no problem of frequent cleaning or reprocessing because of the Oxycat's remarkable ability to withstand contaminating agents and clogging.

It's best to design Houdry Oxidation Catalyst installations into your plant

when it is in the blueprint stage. But your engineers, working with ours, can effectively install Oxycats in any existing plant. If air pollution is a problem in your operation—if foul-smelling, irritating fumes and odors are costing you neighborhood good will—Houdry Oxidation Catalysts present a solution you cannot afford to overlook. Write on your business letterhead for complete information now.



Houdry Oxycats being installed in a waste heat boiler at a Sun Oil Co. catalytic cracking unit at Marcus Hook, Pa. This Oxycat installation and a similar one at Toledo save Sun Oil \$400,000 a year by oxidizing waste gases to generate 100,000 lb. of process steam an hour.



A Houdry Catalyst

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INDUSTRIAL DIVISION

Wayne 7, Pa., U.S.A.

**Fume Elimination Processes and Equipment  
Industrial • Automotive • Consumer Products**

Representatives in major industrial areas

When inquiring check CP 4660 opposite last page

## MATERIALS

### new developmental chemicals

572-609

(Continued from page 66)

572) **p-DIMETHYLAMINO BENZENE** — An indicator and for coloring fats and oils. MP: 114-116°. Eastern.

573) **DIMETHYLAMINO-2-PROPANOL** — 98% pure. BP: 121-127°. Sharples.

574) **\*N\*(1,1-DIMETHYL-2-HYDROXYETHYL)-2-METHYL-1,2-PROPANEDIAMINE** — Curing agent for epoxy resins, stabilizer for melamine finishes and making pharmaceuticals and surface-active agents. BP: 228-230°. Comm. Solv.

575) **\*cis-2,5-DIMETHYLPIPERAZINE** — 98%, with < 3% trans. Intermediate. BP: 164.5°. LD<sub>50</sub>: 22.5 mg/kg. Wyandotte.

576) **\*trans-2,5-DIMETHYLPIPERAZINE** — 98+%. Intermediate. BP: 161.9°. Wyandotte.

577) **\*2,5-DIMETHYLPIPERAZINE** — 98+%. Should be an outstanding intermediate. LD<sub>50</sub>: 1720 mg/kg. BP (742 mm): 154°. MP: 15°. Wyandotte.

578) **DIMETHYLSULFIDE** — This low cost, high purity, synthetically produced sulfide is 98% (wt) pure. It is a solvent, and can be oxidized to dimethylsulfoxide. BP: 36.1°. Sharples.

579) **3,4-DINITROBENZOIC ACID** — DPI.

580) **\*DIOCTYL FUMARATE** — 98-99% pure. As a comonomer in emulsion copolymers, rate of copolymerization should be increased. Also a plasticizer. BP @ 2-4 mm: 140-160°. Jasonols.

581) **DI-OCTYL FUMARATE** — 99% DOF. Comonomer in polymerizations. Internal plasticizer. Rubber Corp.

582) **DI-OCTYL MALEATE** — DOM is a comonomer. 99% pure. Internal plasticizer. Rubber Corp.

583) **DIPHENYL** — Intermediate. Dow.

584) **\*DIPHENYL DISULFIDE** — 99%. Insecticide, fungicide, in rubber vulcanization, stabilization of Ag halide emulsions. Evans Chemetics.

585) **DIPHENYLMETHANE 4,4'-DIISOCYANATE** — Highly reactive, for coatings, adhesives. Nat'l Aniline.

586) **\*DIPHENYL-4-PYRIDYL CARBINOL** — Hydrogenation of the pyridine nucleus has been performed. Potential use: pharmaceutical industry. MP: 236-241°. Sol: hot glacial acetic acid. Exp. Reilly Tar.

587) **\*DIPHENYL-4-PYRIDYL METHANE** — A pale yellow crystalline solid. Active hydrogen makes it a useful starting material for synthesis of other derivatives in this series. Min freezing point: 123.0°. BP @ 20 mm: 234°. Pharmaceutical uses. Sol in common organics. Exp. Reilly Tar.

588) **1,1-DIPHENYL-2-THIOUREA** — DPI.

589) **N,N'-DIPHENYLUREA** — An organic intermediate. purity: 99%. MP: 236-239°. Exp. Eastern.

590) **DIPROPIONIN** — BP: 112-114° @ 0.5 mm. A synthetic fat. DPI.

591) **DISPERSOL** — Resinous product disperses resins, pigments, fillers in aq systems. Reduces flocculation. Easy to incorporate by mixing. Toxic. Abco.

592) **\*DI-TRIDECYL AMINES** — Mixed. BP (1.5 mm): 175-200°. Makes surface-actives, corrosion inhibitors, ore flotation compounds. Exp. Carbide & Carbon.

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When inquiring check CP 4661  
opposite last page

CHEMICAL PROCESSING



593) \*DIVINYL ETHER OF DIETHYLENE GLYCOL — Divinyl Carbitol has BP of 198.7°. Cross-linker for copolymerizations with other ethylenic compounds. Exp. Carbide & Carbon.

594) \*3,9-DIVINYLSPIROBI(m-DIOXANE) — BP (2 mm): 120°. Prep. of polymers and copolymers, cross-linker for polymeric containing active hydrogen. Has two reactive vinyl groups. Exp. Carbide & Carbon.

595) 1-DOCOSANOL — Tech. MP: 62-64°. DPI.

596) \*DODECENYL PRIMENE 81-R — Amine 9D-178 is about 96% pure. Main boiling range @ 10 mm: 120-230°. MP: < -80°. Uses: uranium recovery, antioxidant and corrosion inhibitor for lube oils. Stable. Rohm & Haas Spec. Prod. Dept.

597) n-DODECYL MERCAPTAN — Uses: as polymerization modifier, in synthesis of detergents and lubricants. Purity: 90+ mol %. Exp. Pan American Chem.

598) \*EP-201 — 3,4-Epoxy-6-methylcyclohexylmethyl-3,4-epoxy-6-methylcyclohexanecarboxylate boils with decomposition >150° @ 10 mm. Prep. of epoxy resins, light stabilizer for vinyl chloride resins. Reactivity suggests evaluation as cross-linking agent. Exp. Carbide & Carbon.

599) ETHYL CROTONATE — Intermediate in organic synthesis. 99% pure. BP: 138°. Eastern.

600) ETHYL PHENYLUNDECANOATE — DPI.

601) N-ETHYL-n-BUTYLAMINE — Pract. DPI.

602) ETHYLENE DIUREA — Modifies urea-formaldehyde resins. 99% pure. MP: 190-192°. Exp. Eastern.

603) ETHYLENEDIAMINE — Anhydrous. 99+ % pure. For making fungicides, polyamide resins, chelating agents, pharmaceuticals. Dow.

604) \*ETHYLSULFONYLETHANOL —  $C_6H_5SO_2CH_2CH_2OH$ . Antistatic agent for synthetic fibers and fabrics, humectant, and solvent for polar organics. Intermediate for pharmaceuticals, plasticizers, solvents. 95% pure. MP: 41-43°. BP (@ 2.5 mm): 149-153°. LD<sub>50</sub> (oral) = 18.0 gm/kg (mice). Sharples.

605) ETHYLUREA — Intermediate for making pharmaceuticals, plasticizers, surface-active agents, insecticides, modified urea-formaldehyde resins. 99% pure. Melts @ 92°. Eastern.

606) \*FLUOROACETIC ACID — 98% pure. Catalyst in esterifications; intermediate for esters having fungistatic properties. Very toxic. Exp. Jasonols.

607) \*FLUORANTHENE — 97.2 wt %. A polycyclic hydrocarbon  $C_{16}H_{10}$ . BP: 367°. Made from coal hydrogenation. For dyestuffs, pharmaceuticals, rubber chemicals. Carbide & Carbon.

608) FOAM RESINS — IC 5010 (flexible) and IC 5011 (resilient) for foam rubber. Interchem.

609) \*GLYCERINE CARBONATE — 98+ % pure. Solvent for polymeric materials and a plasticizer. Inter-

(Please turn to next page)

Unless otherwise specified . . .

Pressures are in mm of mercury (abs.)

Boiling points are at 760 mm

Temperatures are in °C

Solubilities are at room temperature

# One of many advantages of 90/10 Cupro-Nickel

# WELDABILITY



Welding head on filter shell

One of the relatively new copper base alloys is 90/10 Cupro-Nickel, which is coming into increased use as a result of experience with it. Revere offers it in sheet and plate, pipe and tube. It is highly resistant to corrosion and erosion, particularly in salt or brackish water. In addition it can be cold or hot worked, welded, soldered and polished. Because its nickel content is less than the older 70/30 alloy, it is priced lower.

The item shown here is a 90/10 Cupro-Nickel filter for aviation gasoline, designed and fabricated by the Warner Lewis Company, Division of Fram Corporation, Tulsa, Oklahoma, for the U. S. Navy. Heads and shell are 1 1/8" thick. Revere was given the opportunity to collaborate with the Warner Lewis manufacturers on welding, which was successfully accomplished by the metallic arc process, using Inco 70/30 Cupro-Nickel electrodes. The vertical weld on the shell was X-rayed 100% and found satisfactory to pass Navy inspection. Because of the thickness of the metal, it was decided to form the heads hot at around 1690° F. The forming was done by the Hackney Iron & Steel Co., Enid, Okla., which also consulted with Revere.

Warner Lewis Company of Tulsa, with representatives in 30 cities, are specializing on all types of alloy design and fabrication and inquiries of this nature are invited.

If you wish information regarding the selection, welding, or working of copper and its alloys and aluminum alloys, see the nearest Revere Sales Office.



Completed aviation gasoline filter, made of 90/10 Cupro-Nickel

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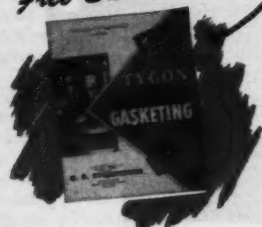
When inquiring check CP 4662 opposite last page



## TYGON GASKETING

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One sure answer to tough gasketing problems is the versatile corrosion-resistant TYGON family of plastic compounds. For TYGON not only resists acids, alkalis, oils, greases and water — but is strong, resilient, abrasion-resistant and light in weight. TYGON is also impermeable, non-contaminating and non-oxidizing. TYGON can be used for virtually any gasketing job in chemical processing and general industrial equipment — wherever positive, enduring seals or separators are required. For food and beverage uses, special non-toxic compounds are also available.

For service as gasketing, TYGON is made in a number of standard compounds, translucent or glossy black, which offer a range of physical, electrical, and chemical properties for almost any application.

TYGON gaskets can be die-cut from calendered or press-polished sheets (1/64" to 1/2" thick); can be molded in practically any size or shape; or can be extruded as tubing, solid cord, or channel in continuous lengths.

PLASTICS AND SYNTHETICS DIVISION

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**OTHER TYGON PLASTICS:**  
Tygon is likewise made in the form of flexible tubing, hot and cold applied protective coatings, protective sheet linings for acid tanks, and in molded form.

When inquiring check CP 4663 opposite last page

## MATERIALS

### new developmental chemicals 610-648

(Continued from preceding page)

mediate for drugs, pharmaceuticals, agricultural chemicals. By decomposition, it offers easy route to the reactive epoxide glycidol. BP @ 0.1 mm: 125-130°. Jefferson.

610) \*HEAVY WATER — 10% O<sub>2</sub>. Exp. Dajac Labs.

611) \*HET® ANHYDRIDE — 99% C<sub>6</sub>H<sub>4</sub>O<sub>2</sub>Cl<sub>2</sub> contains 57.4% stable Cl. Gives fire retardance, good high temp flex properties, good electrical properties with epoxy resin. Intermediate for agricultural chemicals, pharmaceuticals, polyesters, resins. Hooker.

612) HEXACHLOROBUTADIENE — 95+%. Inter-med. Exp. Dow.

613) HEXAMETHYLENE GLYCOL — For modifying alkyd resins, in making plasticizers, as component in hydraulic fluids. 99% pure. MP: 40-42°. BP: 250°. (CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>OH)<sub>3</sub>. Eastern.

614) 1,6-HEXANEDIOL — MP: 40-42°. DPI.

615) \*HEXANOIC ACIDS — Mixture boiling 194.4-199.2°. For preparation of flavor components, plasticizers. Carbide & Carbon.

616) \*HEXYL ALCOHOLS — Mixture of primary alcohols boils 147.5-180°. Solvent, extractant. Makes fuel oil additives, plasticizers, surface-active agents. Carbide & Carbon.

617) n-HEXYL MERCAPTAN — Makes detergents, lubricants, insecticides. Min purity: 95 mol %. BP: 149-152°. Pan American Chem.

618) 3-HYDRAZINOQUINOLINE DIHYDROCHLORIDE — Provides hydrazine activity. DPI.

619) N-(2-HYDROXYETHYL)-2-PHENOXYACETAMIDE — MP: 48-51°. DPI.

620) \*4-HYDROXYISOPHTHALIC ACID — Anal-gesic; chemical intermediate. Monsanto.

621) \*HYDROXYPIVALDEHYDE — 90% (dry basis) CH<sub>3</sub>OHC(CH<sub>3</sub>)<sub>2</sub>CHO. BP @ 15 mm: 85°. Eastman C. P.

622) \*N-(2-HYDROXYPROPYL)ETHYLENEDIAMINE — Monolene has 98+% assay and BP of 118° (114 mm). Makes cationic surface-active agents and resins. Wyandotte.

623) p-HYDROXYVALEROPHENONE — DPI.

624) \*INHIBITOR — M. D. 674 rust inhibitor for steel. Good fume depression, flux properties. Swift.

625) ISOCINCHOMERONIC ACID — 99%. ICA is precursor of nicotinic acid, intermediate for polyesters, polyamides, insecticides, pharmaceuticals. Has ring-nitrogen structure. DuPont Explosives Dept.

626) \*ISOSEBACIC ACID — Mixture of 3 C<sub>10</sub> dicarboxylic acids. MP: 68-74°. Intermediate for plasticizers, ester lubricants, resins. USI.

627) LAURYL ALCOHOL — 95% C<sub>12</sub>. Intermediate for sodium lauryl sulfate, quaternaries, dodecyl mercaptan. Rohm & Haas Spec. Prod. Dept.

628) LITHIUM BOROHYDRIDE — 99.8+%. Water sol. For reductions. MP: 279°. Aldrich.

629) MANGANESE DIBROMIDE — MnBr<sub>2</sub>•4H<sub>2</sub>O of 99% purity. Exp. Eastern.

630) MERCURIC PHOSPHATE — Pure powd. City Chem.

631) METHOCEL FILM — High purity. For use as water-soluble film. Dow.



## MATERIALS

632) METHYL BENZENESULFONATE — BP: 149-151°. DPL.

633) METHYL CROTONATE — Intermediate in organic synthesis. 99% pure. BP: 128°. Eastern.

634) \*2-METHYL CYCLOHEXANOL — BP: 167.7°. A solvent; intermediate for dyestuffs, esters, oil additives, wetting agents. Carbide & Carbon.

635) \*METHYL DIMETHOXYACETATE — BP: 65° @ 15 mm. For pharmaceutical, organic syntheses. Kay-Fries.

636) \*3-METHYL GLUTARALDEHYDE — For insolubilization of polyhydroxies and proteins for use in coatings for paper, textiles, cork binders. Imparts water resistance to PVA latices and films. MP of 45% soln: -5.6°. Exp. Carbide & Carbon.

637) \*3-METHYL GLUTARIC ANHYDRIDE — BP (10 mm): 152°. Prep. of polyesters, resins, plasticizers. Exp. Carbide & Carbon.

638) \*METHYL METHOXYACETATE — BP: 131°. For pharmaceutical, organic syntheses. Kay-Fries.

639) \*3-METHYL 1,5-PENTANEDIOL — BP: 248.4°. For polyesters, resins, plasticizers. Exp. Carbide & Carbon.

640) \*METHYLCYCLOPENTADIENE DIMER — C<sub>10</sub>H<sub>16</sub>. Prep of alkali metal derivatives, dibasic acids. As intermediate for synthetic perfumes, flavors, resins, plasticizers. High purity (95%), versatile reactivity, low sulfur content, potential low cost. BP: 200°. Enjay.

641) N-METHYLENE GLYCINONITRILES — BP: 125-128°. Intermediate. Exp. Dow.

642) \*2-METHYLPYRAZINE — 98%. Intermediate. MP: 65-66°. BP: 155.6°. LD<sub>50</sub>: 410 mg/kg. Wyandotte.

643) \*2-METHYLPYRAZINE — 98+% C<sub>6</sub>H<sub>8</sub>N<sub>2</sub>. Should be an outstanding intermediate. LD<sub>50</sub>: 1560 mg/kg. BP (@ 737 mm): 130°. MP: -29°. Wyandotte.

644) METHYLSTYRENE-ACRYLONITRILE COPOLYMER — Plastic has high heat resistance. Am Cy.

645) METHYLUREA — Intermediate for pharmaceuticals, plasticizers, surface-active agents, insecticides, and modified urea-formaldehyde resins. 99% pure. MP: 99-101°. Exp. Eastern.

646) MONOETHYL ADIPATE — For introducing adipyl group in organic synthesis. 99% pure. Eastern.

647) \*MONOETHYL UREA — For urea-type resins. 98% pure. MP: 93°. Fine Organics.

648) \*NAPHTHALENE-FORMALDEHYDE RESIN — Used in paints, mastic tile, rubber compounding, also in textiles and printing inks. Three soft point grades available: 80°, 100°, and 120°. Cloud point: 120°. Color: 2-5. Iodine No.: <5. Cloud point: 150°. Sp gr (20/20°): 1.17. Thermoplastic is tack-free. Sol: aromatics, chlorin-

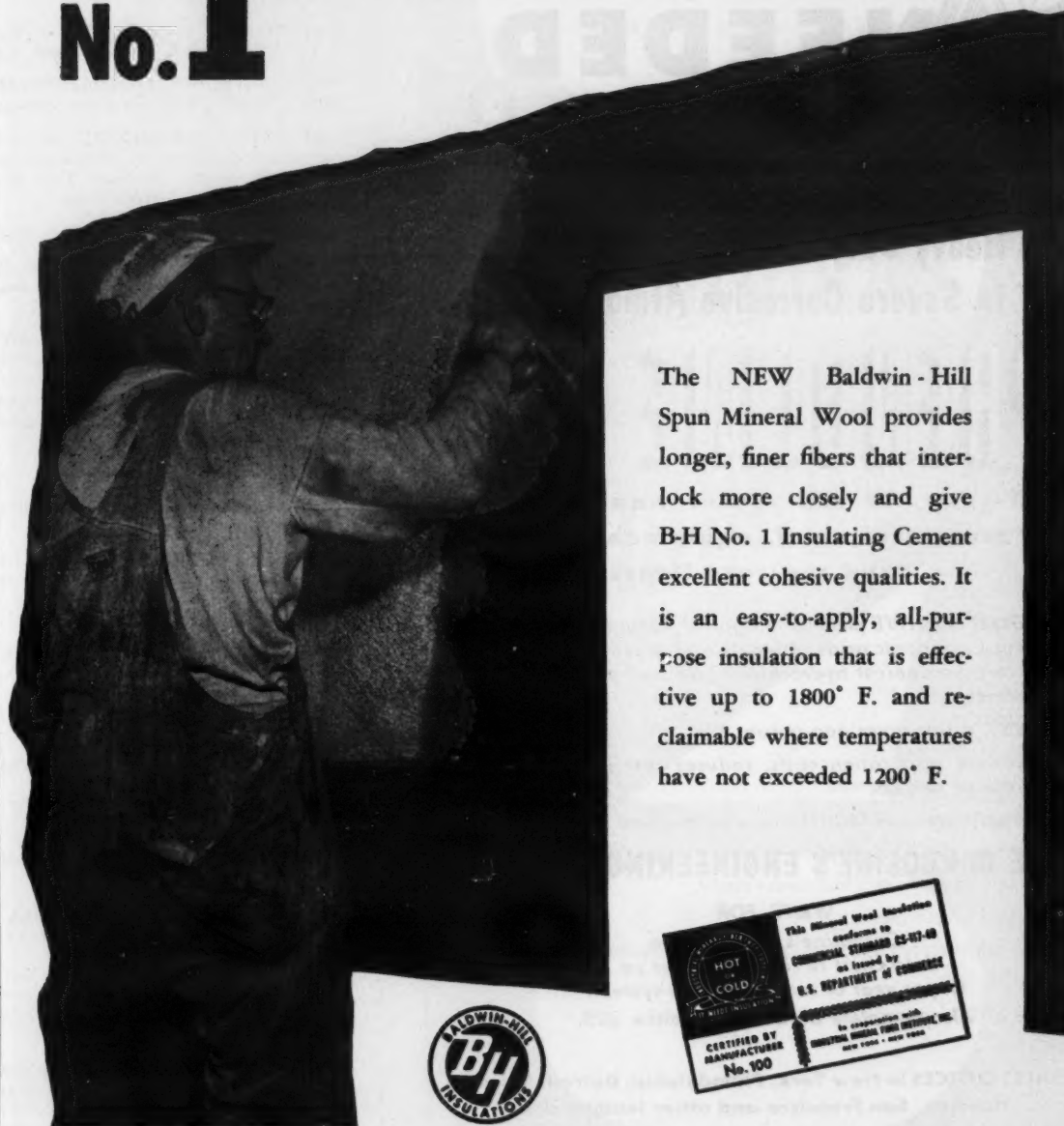
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THE QUICK WAY to pin-point a chemical material for a specific application is to use the "Use-Index" on page 32.

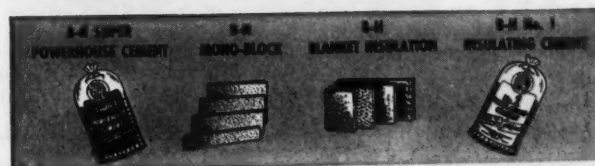
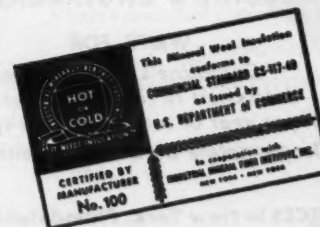
MANUFACTURER ADDRESS LIST starts on page 82. Contact them for additional details.

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When inquiring check CP 4665 opposite last page

## MATERIALS

new developmental chemicals  
649-684

(Continued from preceding page)

ated hc's, terpene hc's. Pt sol: esters, ketones, paraffins.  
Insol: glycols, alcohols. Neville Chem.

649) NEOYMIUM SULFATE — Pure rose-violet cryst.  
Water sol. Lab scale. City Chem.

650) NICKEL SULFAMATE — Pure green cryst.  
Water sol, for nickel plating baths. City Chem.

651) p-NITROBENZENEDIAZONIUM FLUOBOR-  
ATE — Color-former for paper chromatography. DPI.

652) NITROCYCLOHEXANE — 95+%. NCH is a  
solvent, intermediate for cyclohexylamine, caprolactam,  
insecticides, rubber chemicals. Dec. @ 205°. Moderate  
toxicity. DuPont Explosives Dept.

653) NITROCYCLOHEXANE — Pract. DPI.

654) 2-NITROSO-1-NAPHTHOL — Forms complexes  
with metals; cobalt complex used in analysis. 95% pure.  
C<sub>10</sub>H<sub>7</sub>NO<sub>2</sub>. MP: 157°. Eastern.

655) \*OCTACHLOROMETHENE-1-CYCLOPENTENE-  
2 — Industrial Fungicide 1713 for mildewproofing cellu-  
lose products, as fungicide for surface coatings, slime  
control, and as seed fumigant. LD<sub>50</sub> (oral) = 30 gm/kg  
(mice). MP: 180.5-184.5°. 95% pure. Stable, light  
colored. Sharples.

656) OCTADECYLBROMIDE — Intermediate. Dow.

657) OCTADECYLUREA — Modifies urea-formalde-  
hyde resins. 99% pure. MP: 110-113°. Exp. Eastern.

658) n-OCTYL MERCAPTAN — Uses: rubber and  
plastics processing, intermediate for agricultural, rubber,  
plastic, mining chemicals. 98.5% pure. BP: 197.3-198-  
3°. Sharples.

659) \*ORGANO HALOPHOSPHATE — Industrial  
Fungicide 1638 has low toxicity (LD<sub>50</sub> = 1.4 gm/kg  
oral, mice) and low skin irritancy. Colorless, stable, non-  
metallic fungicide is for surface coatings, textiles, pulp  
and paper. MP: 230-234°. 95% pure. Sharples.

660) OXYBIS (2-ETHYLBENZOATE) — Pract. DPI.

661) \*PALCOBOND — Binder, resin extender. Pacific  
Lumber.

662) PARADIAZ NO. 1 — Stabilized diazo for dupli-  
cating processes. Am Cy.

663) N,N-PENTAMETHYLENEUREA — Modifies  
urea-formaldehyde resins. 99% pure. Exp. Eastern.

664) \*PENTANALS — Mixture boils 87-107°. Con-  
densation with phenols gives oil-sol resins; condensation  
with amines gives rubber accelerators; synthesis of amyl  
amines. Carbide & Carbon.

665) PERHALOGENATED, MONOBASIC CARBOX-  
YLIC ACIDS — Kel-F® Acid 683 is the hexanoic acid  
and Acid 8114 is the octanoic acid. They can be used  
as surface-active agents and dispersants, and as inter-  
mediates for rubber accelerators, antioxidants, plasticizers,  
rust inhibitors. Kellogg.

666) \*PHENANTHRENE — 96.8% (wt) purity ma-  
terial from coal hydrogenation. Intermed. for dyestuffs,  
pharmaceuticals, rubber chemicals. Carbide & Carbon.

See Materials Data, page 74

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cloth, is the easiest acid to handle and  
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City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

When inquiring check CP 4666  
opposite last page

CHEMICAL PROCESSING



## MATERIALS

667) \*PHENYL p-TOLUENE SULFONATE — Tech grade plasticizer for nitrocellulose, PVC, PVAc. High melting solid. Monsanto.

668) \*N'-PHENYL-2-METHYL-1,2-PROPANEDIAMINE — Curing agent for epoxy resins, stabilizer for melamine and other resin finishes, and in manufacture of pharmaceuticals and surface-active agents. BP: 264-266°. Comm. Solv.

669) PHENYLUREA — Modifies urea-formaldehyde resins and is an intermediate. 99% pure. Eastern.

670) PHOSPHONITRILIC CHLORIDE — (PNCl<sub>2</sub>)<sub>2</sub>. Forms inorganic polymers having heat and flame resistance, especially promising with glass and asbestos. Polymers used in protective coatings and lube additives. Millmaster.

671) 3-PICOLINE — 98% pure, by IR analysis. Can be oxidized to nicotinic acid. BP: 143.5°. Ansul.

672) \*POLYESTERS, UNSATURATED — Dion DR-01 and DR-03 for use with isophthalic acid; gives excellent adhesion to glass fibers, high impact strength, good surface hardness, and high heat distortion. Use: plastics. Chem. Process Co.

673) POLYETHYLENE — High mw. Hi-Fax is made by Ziegler process. Hercules.

674) \*POLYISOPRENE RUBBER — SN Ameripol rubber is a direct replacement for natural rubber. Exp. Goodrich-Gulf.

675) POLYMETHYLSTYRENE — PDL 2-400 for radio cabinets, battery cases. High heat resistance. Am Cy.

676) POTASSIUM METAPERIODATE — ACS Reagent grade. Arapahoe.

677) \*POTASSIUM N-METHYLTAURATE — For making acyl methyl taurides, surface-active agents. More sol than Na salt. Gen. Aniline.

678) \*PRIMARY AMYL AMINES — BP: 99.1°. Makes rubber accelerators, corrosion inhibitors, pharmaceuticals, carbon removal compounds, textile chemicals. Exp. Carbide & Carbon.

679) \*PROPENYL ETHYL ETHER — BP: 70°. For pharmaceuticals, copolymers. Exp. Carbide & Carbon.

680) PROPYLENE DIUREA — Modifies urea-formaldehyde resins. 99% pure. Exp. Eastern.

681) PURINE — 99-100% pure. In study of biochemical mechanisms. Exp. Krishell Labs.

682) \*PYRENE — A refined polycyclic hydrocarbon for preparation of dyestuffs, fluorescent coloring agents. Carbide & Carbon.

683) \*PYRIMIDINE — 99-100% pure. In study of biochemical mechanisms. Exp. Krishell Labs.

684) \*PYROMELLITIC ACID — 98% PMA melts: 257-265°. Uses in alkyd resins, as acid intermediate for polyesters, polyamides, polyimides, and tetra-esters. The

(Please turn to page 75)

Unless otherwise specified . . .

Pressures are in mm of mercury (abs.)

Boiling points are at 760 mm

Temperatures are in °C

Solubilities are at room temperature

## Can Fabric Filter a Solution of H<sub>2</sub>SO<sub>4</sub> and HCl?

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withstand the chemical action. And in the soap industry, when operating temperatures may exceed 200°F., heat-resisting nylon fabrics are used.

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For names of distributors, and a free copy of "Filter Fabric Facts," write Dept. M-4.

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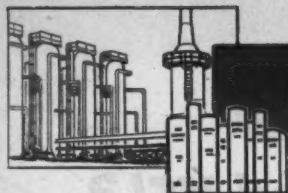
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When inquiring check CP 4667 opposite last page



# processing and engineering data

116c

## VAPOR PRESSURE DATA II

Nomograph by BRUCE FADER, Associate Editor

and

FRANK McELROY, Assistant Editor

Nomograph is on page 76

Vapor pressures of various solvents can be found by plotting at individual coordinates, given below, on the grid of the following nomograph (page 76). By connecting a straight line between temperature and the coordinate, vapor pressure can be found along the extension of the line. Conversely, a boiling temperature can be found for each pressure.

The coordinates give a reasonably accurate set of data in the temperature range indicated under each compound.

Nomograph can also be used to approximate vapor pressures of paraffin mixtures, if the vapor pressure of the mixture is known for at least one temperature. To do this, connect these two points with a straight line, and find point of intersection on tie-line. Use this point as you would above.

### Typical Example

A certain compound is listed with coordinates X = 11, Y = 61. Its vapor pressure at a given temperature is found by extending a straight line drawn from this temperature on the right scale, through the coordinates. In this case, a 45°C temperature gives a vapor pressure of about 1500 mm (Hg).

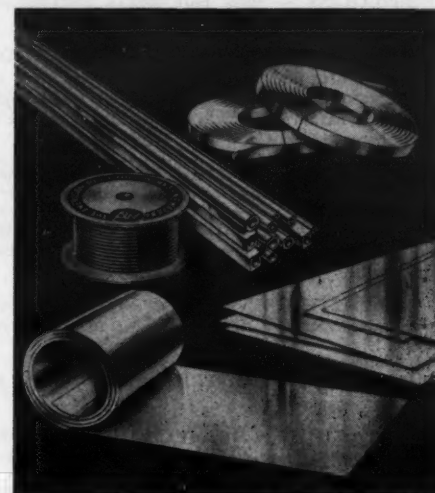
At what temperature will the compound boil at standard pressure? Connect 760 mm with the coordinates and extend the line. Read 20°C.

(Please turn to page 76)

### LITERATURE CITED

JORDAN, "Vapor Pressure of Organic Compounds," Interscience Publishers, Inc., New York (1954)

COMPOUNDS	COORDINATES		COMPOUNDS	COORDINATES		COMPOUNDS	COORDINATES	
Temp range °C	X	Y	Temp range °C	X	Y	Temp range °C	X	Y
Acetone -70 to +125	18	50	Dipropylene glycol 74 to 240	27½	22	Methyl amyl ketene 10 to 160	25	32
Amyl acetate 0 to 155	23½	34	Ethanol -38 to +135	22	43	Methyl chloride -70 to +33	10½	69½
Anisole 5 to 156	23	33½	Ether -85 to +102	16½	54½	Methyl ethyl ketene -48 to +90	19	46
Butanol 0 to 185	24	36½	Ethyl acetate -43 to +145	19½	46	Methylene chloride -70 to +41	17½	53
Butyl acetate 0 to 135	22½	37½	Ethylene glycol 45 to 205	27	25½	Nitramethane -28 to +110	21	41½
Carbon disulfide -82 to +155	16	53½	Formaldehyde -100 to -13	67½	12½	1-Nitropropane 0 to 143	22½	37
Carbon tetrachloride 0 to 150	19	46½	Glycerol 125 to 300	29½	15	Perchloroethylene -20 to +130	21	39½
Chloroform -60 to +61 61 to 130	19 17½	49½ 50	Isobutanol -10 to +165	22½	38½	Propanol -15 to +158	24	39½
p-Cymene 0 to 177	23½	31½	Isopropanol -25 to +140	23	42	Propyl acetate -35 to +165	21½	41½
Diacetone alcohol 22 to 178	25	30½	Mesityl oxide 0 to 137	22½	37	Propylene dichloride 0 to 105	19	43½
Diethanolamine 107 to 271	29	17½	Methanol -44 to +123	21	46½	1,2-Propylene glycol 50 to 195	25	28
Diethylene glycol 80 to 255	28½	19½	Methyl acetate -57 to +125	19	49½	Trichloroethylene -20 to +100	19½	45



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CHEMICAL PROCESSING



**new developmental chemicals**  
685-699

(Continued from page 73)

acid is highly reactive, tetrafunctional, and symmetrical. DuPont Explosives Dept.

685) **PYROMELLITIC ACID** — Pract. DPI.

686) **\*PYROMELLITIC DIANHYDRIDE** — 98%. PMDA melts: 286°. BP: 397-400°. Highly reactive, symmetrical, aromatic acid dianhydride is curing agent for epoxies, intermediate for polyesters, polyamides, polyimides, acid di-esters. Low toxicity. DuPont Explosives Dept.

687) **QUATERNARY AMMONIUM COMPOUND** — 50% active. Ahco DD-50 is a sanitizing agent. Arnold, Hoffman.

688) **\*QUATERNARY AMMONIUM COMPOUND** — Warco A-298 is a textile finish with excellent antistatic properties. About 40% active. Warwick.

689) **QUINOXALINE** — Prototype compound of an extensive ring system. DPI.

690) **\*SANTICIZER 300** — Permanent plasticizer for PVC. Low viscosity, volatility. Monsanto.

691) **SEBACANILIDE** — Pure white powder. MP: 201°.  $(C_6H_5CONH)_2 (CH_2)_8$ . City Chem.

692) **\*SEROTONIN CREATININE SULFATE** — 98+%. A stable complex salt of Serotonin, for pharmacological research. MP: 215-217°. Abbott.

693) **SILICA** — Colloidal, finely divided, amorphous compound. Flattening agent for varnishes, lacquers. Filler for resins, plastics. Thickener. Inert. Insoluble and hydrophilic. Philadelphia Quartz.

694) **\*SILICEOUS ADSORBENT** — Permutit is an adsorbent for organics. Has high regenerative rate. Permutit.

695) **\*SILICONE FINISH** — Y-1000 is glass cloth finish for phenolic, epoxy, melamine laminates. Improves laminate strength. UCC Silicone.

696) **SILICONE GREASE** — 81508 Grease is thread lube for extreme temp service. Dielectric. GE Silicone.

697) **SILICONE LUBRICANT** — 81528 Glass Mold Lube is release agent for delivery equipment and molds on glass container machines. No smoke, fumes. GE Silicone.

698) **SILICONE MOLDING MATERIALS** — For products requiring heat resistance, good electrical and mechanical properties, and weather resistance. Savings in weight and size of electrical equipment are made possible. GMGA-5001 and -5002 are general-purpose mineral-filled compounds. GMGA-5003 and -5004 are glass-filled, have high impact resistance. Bakelite.

699) **\*SILICONE OIL EMULSION** — LE-450 Emul-  
(Please turn to page 77)

THE QUICK WAY to pin-point a chemical material for a specific application is to use the "Use-Index" on page 32.

MANUFACTURER ADDRESS LIST starts on page 82. Contact them for additional details.



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**NEW WEATHER RESISTANCE**

A new type of weather-resistant alkyd resin—made from isophthalic acid and *Glycerine*—is now being offered in experimental quantities.

The stability and compatibility of *Glycerine* as a polyol in surface-coating alkyds and its low MW/Hydroxyl ratio, have for years made a wide range of resin properties feasible.

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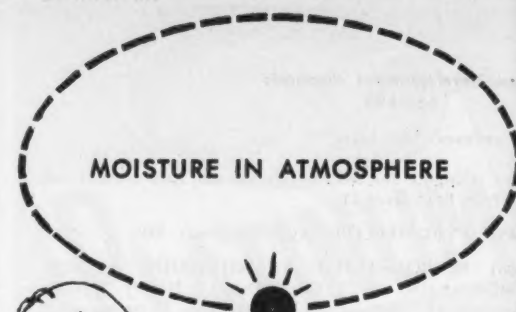
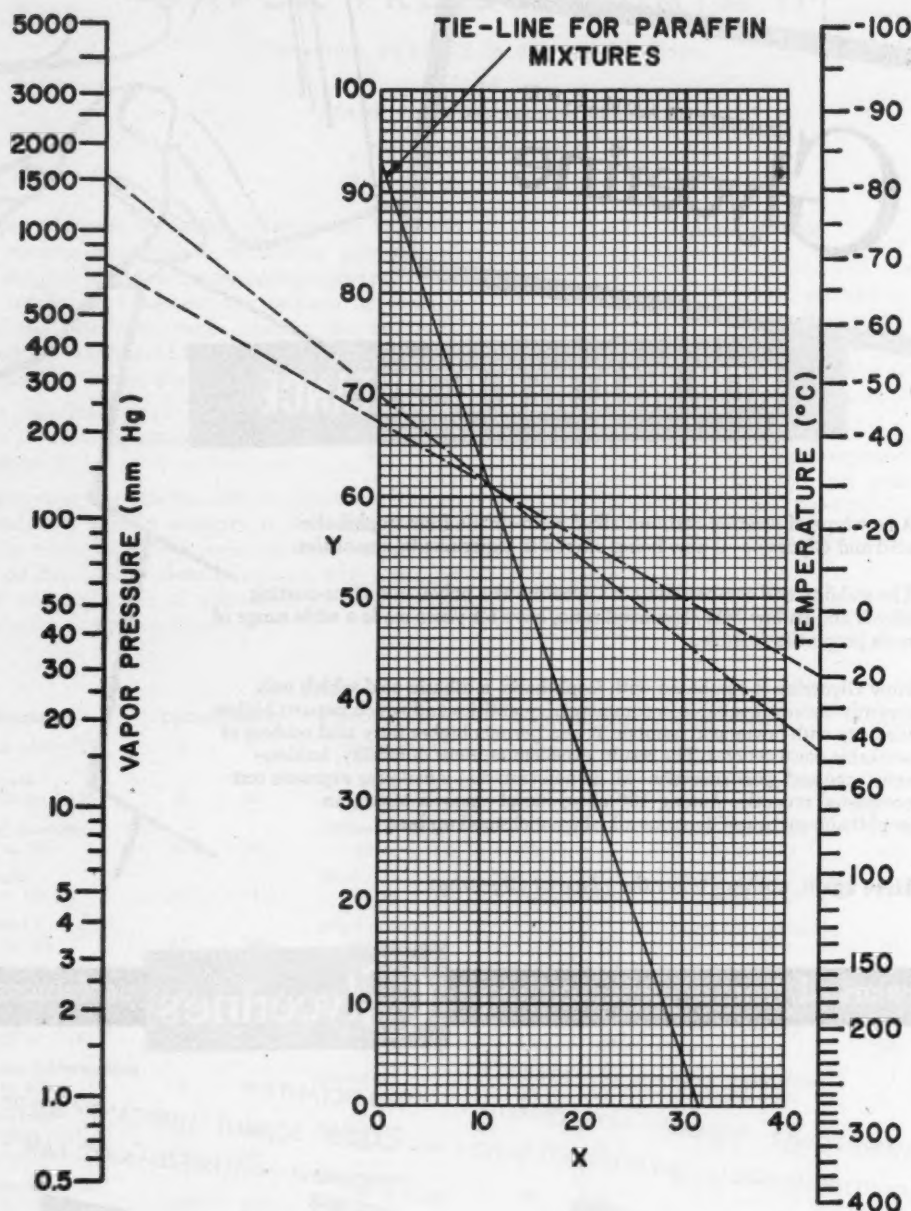
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When inquiring check CP 4669 opposite last page



(Continued from page 74)



**CORROSION**



*Cat-a-lac*  
**PRIMER**



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Cat-a-lac Primer has three times the CORROSION INHIBITING qualities of any known specification primer... AND it has proven to be a 100% more efficient barrier to

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due to dissimilar metals, including

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Corrosion inhibiting Cat-a-lac Primer is a universal type primer. With Cat-a-lac Primer next to the metal, you can use Cat-a-lac Top Coat or any other top coat you wish.

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Division of Desmond Brothers Paint Company  
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CHEMICAL PROCESSING



**new developmental chemicals**  
**700-716**

(Continued from page 75)

sion. Highly stable rubber mold release agent. UCC Silicone.

700) **SILICONE PRESSURE-SENSITIVE ADHESIVE** — 81585. Adhesive for making pressure-sensitive tapes for service at extreme high or low temp. GE Silicone.

701) **SILICONE RUBBER COMPOUND** — 81502 for soln coating glass fabric for ducting. GE Silicone.

702) **SILICONE RUBBER COMPOUNDS** — For molded, extruded, calendered parts where low compression set is a requisite. Compound 81578 has 80 Duro, 81577 has 70 Duro, and 81576 has 60 Duro. GE Silicone.

703) **SILICONE TEXTILE FLUID** — 18432A and 81268 Fluids give durable water repellency. GE Silicone.

704) **SILICONE-ORGANIC RESIN** — 81572 is vehicle for heat resistant paints. Retains gloss. GE Silicone.

705) **\*SODIUM N-(n-BUTYL) TAURATE** — Intermediate for surface-active agents. Gen. Aniline.

706) **\*SODIUM COPPER CHROMATE** — Basic form of compound has 97% min purity, gives anti-fouling, anti-corrosion properties to marine paints. Mutual.

707) **\*SODIUM N-CYCLOHEXYLTAURATE** — Intermediate for low-foaming surface actives. Gen. Aniline.

708) **SODIUM TAURATE** — Makes acyl taurides for use as surface-active agents. Gen. Aniline.

709) **\*SODIUM 2,4,5-TRICHLOROPHENOXYETHYL SULFATE** — Natrin is 80% active. For killing germinating weed seeds. Exp. Carbide & Carbon.

710) **\*STEARYL TRIMETHYL AMMONIUM TOSYLATE** — Ca. 98%. Waxy. Fungicide for plants. Fine Organics.

711) **STYRENE OXIDE** — Intermediate, stabilizer for chlorinated rubber, diluent for epoxy resins, making epoxy-type condensation resins. BP: 194.1°. Exp. Carbide & Carbon.

712) **SUCCINYL CHOLINE CHLORIDE** — MP: 162-164°. Meets NNR-1954 stds. Arapahoe.

713) **SULFATED TRIDECYL ALCOHOL DERIVATIVES** — G-2842 is Na salt, G-2843 is NH<sub>4</sub> salt. Anionic detergents for shampoo-type formulations. Rabbit eye irritation studies indicate them to be satisfactory when diluted to 10% active ingred. Products supplied as 27.5% active aq soln. Exp. Atlas Chem Div.

714) **1,2,3,4-TETRABROMOBUTANE** — DPI.

715) **\*2, 2, 3, 3, -TETRACHLOROHEXAFLUOROBUTANE** — A volatile wax-like solid of 95+% purity. MP: 83°. A fumigant, protective coating. Exp. Hooker.

716) **\*TETRACHLOROMETHYLENE CYCLOPENTENDIONE-1,3** — Industrial Fungicide 1711 has low skin irritancy and low oral toxicity (LD<sub>50</sub> (oral) = 1.2

(Please turn to page 79)

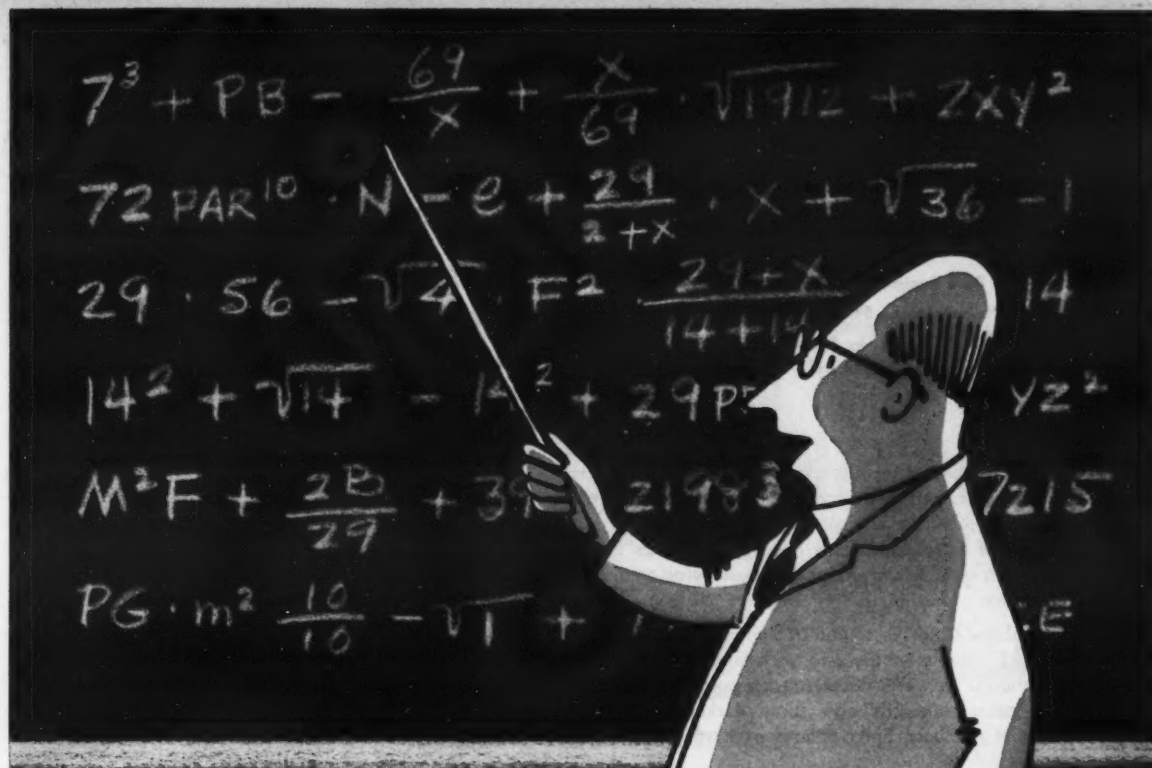
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• ☐ "General Information on Petrolatums"  
• I.R. Bulletin "B"

• ☐ "General Information on Petroleum Sulfonates"  
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• Company . . . . .

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When inquiring check CP 4671 opposite last page



## Color Conversion for Fatty Acids

Data furnished by EMERY INDUSTRIES, Inc.  
 Nomograph by BRUCE FADER, Associate Editor  
 Checked by PAUL N. GARDNER  
 President of GARDNER LABORATORY, Inc.

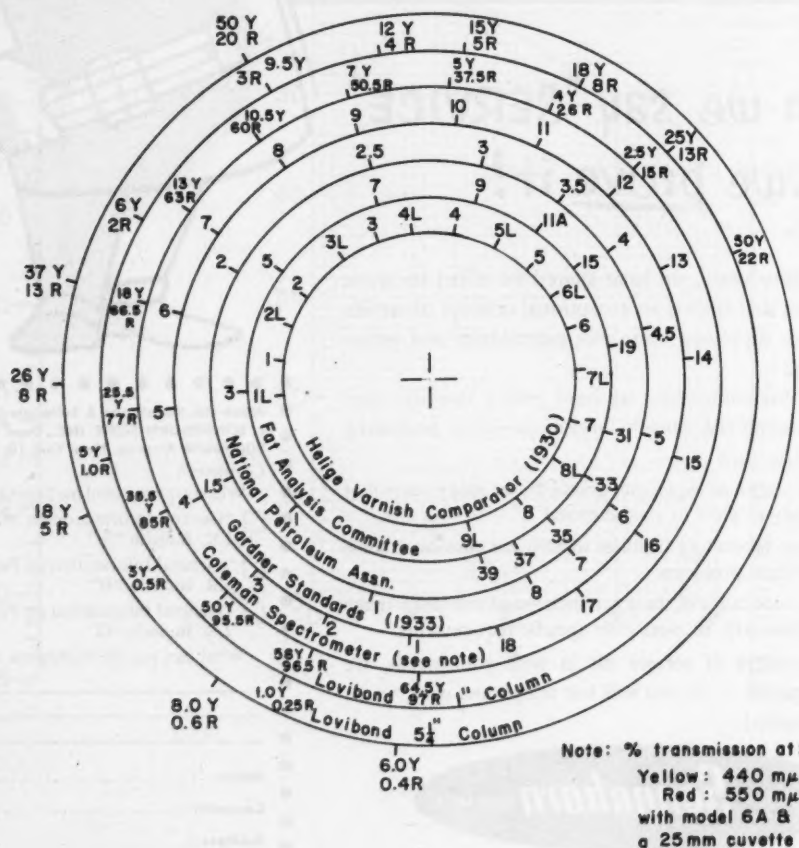
The number of distillations performed on an oleic acid governs its color and, to some extent, its purity. Several methods are currently in use to determine color of fatty acids. This nomograph makes it possible to quickly convert one type of color reading to another.

Lovibond color is found by comparing a 5 1/4 or a 1-inch column of the acid with color filters. Higher Lovibond numbers denote darker colors. Several sets of color standards also show darker colors with higher numbers. Spectrophotometric methods usually

measure transmission of 550 and 440 millimicron waves (red and yellow). Since figures refer to transmission of light, higher numbers indicate lighter colors.

To use the nomograph, lay a straightedge through the center so that it intersects any known color reading. Intersections with other scales will show corresponding color reading in terms of other units.

Data for this nomograph are taken from a 20-page publication, "Emersol Oleic Acids." In addition to providing factual data on color and other characteristics of various grades of acid, this booklet provides information of oxidation properties, color and color stability, standard tests and performance, and several sets of curves and tables. "Emersol Oleic Acids" is issued by Emery Industries, Inc., Dept. CP, Carew Tower, Cincinnati 2, Ohio. When inquiring specify CP 4672 on form opposite last page.



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Hard, dense, highly active, granular carbons have been developed for many operations where fixed bed percolation offers advantages. Complete details available — just tell us your particular interest and we'll show you what we have to offer.

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When inquiring check CP 4674 opposite last page

CHEMICAL PROCESSING



**new developmental chemicals**  
**717-732**

(Continued from page 77)

gm/kg (mice)). Colorless and stable, it's used for surface coatings, textiles, pulp and paper, as a fumigant, and as a germination control agent. MP: 230-232°. Sharples.

717) 1,2,3,4-TETRAHYDRO-6-METHOXYQUINOLINE — MP: 40-42°. DPI.

718) \*2,2,3,3-TETRAMETHYL BUTYRALDEHYDE — BP (750 mm): 148-150°. An odorant, chemical intermediate. Exp. Carbide & Carbon.

719) \*TETRAMETHYL DIACETAL MALONALDEHYDE — Cross-linking, insolubilizing agent. Pharmaceutical, general intermediate. BP @ 12 mm: 66-67°. Kay-Fries.

720) 1,1,4,4-TETRAPHENYL-1,3-BUTADIENE — Purity: 99.9%. Use: as a phosphor in scintillation counters. MP: 201-202°. Exp. Eastern.

721) THIOACETAMIDE — Substitute for H<sub>2</sub>S. Arapahoe.

722) \*THIODIGLYCOLIC ACID — 98.5+%. MP (min): 128°. Intermediate, stabilizer, Na and Ag salts for pharmaceuticals. LD<sub>50</sub> (rabbits): 1.86 gm/kg. White powder. Evans Chemetics.

723) THIXO — Non-toxic mixture of emulsifiers, thickeners, plasticizers to increase thixotropy of aq systems. Can serve as lubricant, non-migrating plasticizer. BP: ca. 60°. Abco.

724) \*o-TOLUENESULFONYL CHLORIDE — Organic intermediate. Stable in storage. Monsanto.

725) \*p-TOLUENESULFONYL CHLORIDE — Organic intermediate. Stable in storage. Monsanto.

726) 2,4-TOLYLENE DIISOCYANATE — Foams, elastomers, where single isomer is required. Nat'l Aniline.

727) \*2,2,3-TRICHLOROHEPTAFLUOROBUTANE — A coolant, dielectric, refrigerant. Can be polymerized. BP: 98°. Resists oxidation. Exp. Hooker.

728) \*2,2,3-TRICHLOROPROPIONALDEHYDE — BP: 70° @ 50 mm. Makes biologically active compounds, pharmaceuticals, insecticides. Exp. Carbide & Carbon.

729) \*TRIDECYL ACRYLATE — BP (10 mm): 150°. Makes polymers and copolymers for adhesives, latex paints, textile finishes; oil additives and VI improvers. Exp. Carbide & Carbon.

730) TRIETHYLBENZENE — Scintillation grade. Dow.

731) TRIETHYLENE GLYCOL — Solvent for cellulose. Resin intermediate. Stable. Nitrogen-Allied.

732) \*TRIFLUOROACETIC ANHYDRIDE — 98-100%. BP: 39°. Freezes: -65°. Increases yield in difficult (Please turn to page 81)

THE QUICK WAY to pin-point a chemical material for a specific application is to use the "Use-Index" on page 32.

MANUFACTURER ADDRESS LIST starts on page 82. Contact them for additional details.

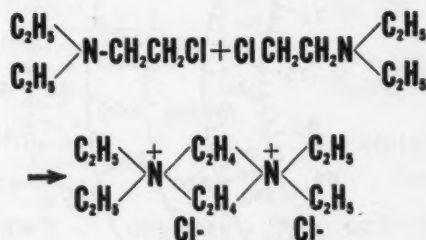
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**TECHNICAL GRADES of DIFUNCTIONAL DMAE\* and DEAE\***  
...offer you a lower-cost way of using these versatile compounds.

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**\* DIMETHYLAMINOETHANOL**  
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**Both Contain:** 1. Basic tertiary nitrogen.  
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Here's an unusual experimental reaction of the chloride derived from DEAE:



Write for Sharples Report 55-4 on DMAE 281 and Report 55-5 on DEAE 282 on the uses, properties and chemistry of these amine alcohols, to guide you in your evaluation of these compounds.

... and here are some of the actual commercial applications where these products are useful:

- (1)-Fugitive emulsifier amine soaps. (Floor waxes; auto polishes).
- (2)-Volatile boiler water corrosion inhibitors (pH adjusters).
- (3)-Intermediates for ion exchange resins.
- (4)-Intermediates for lube oil additives.
- (5)-Rust preventives (in hydrocarbon and aqueous systems).



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When inquiring check CP 4675 opposite last page

## Alkali Equivalents

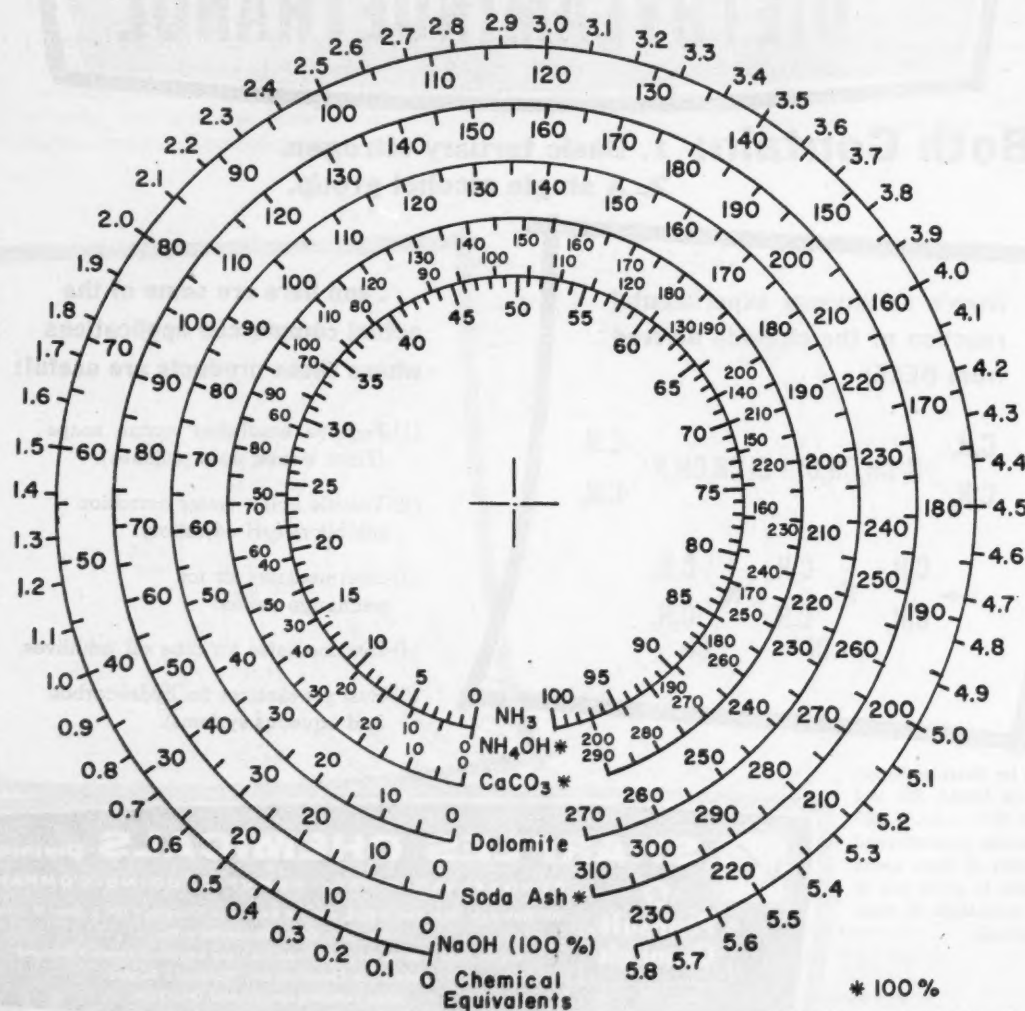
Data from "Soda Ash" published by  
WESTVACO CHLOR-ALKALI DIVISION  
of Food Machinery and Chemical Corp.

Nomograph by BRUCE FADER, Associate Editor

This nomograph is intended to make possible quick conversion between common alkalis in terms of neutralizing power (chemical equivalents). Outer scale of the chart shows chemical equivalents directly — so that lining up pound equivalents of acid on outside scale with center of the circle will produce the number of pounds of each alkali necessary to neutralize the acid. Chart may be used with grams, tons or any consistent units. Where desired values fall off

scale, use decimal multipliers.

Data are taken, in part, from "Soda Ash," a 42-page data book. It covers manufacture, properties of various grades, and contains eight pages of tables and graphs. "Soda Ash" is issued by Westvaco Chlor-Alkali Div., Food Machinery and Chemical Corp., Dept. CP, 161 E. 42 St., New York 17, N.Y. When inquiring specify CP 4676 on form opposite last page.



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Through use of the correct aromatic compound, objectionable industrial or product by-odors can be made inoffensive easily, effectively and economically. As pioneers in the field of industrial odor control, we can give you helpful assistance toward the elimination of almost any unpleasant or sales-retarding odor with which you may have to contend. What is your odor problem? Write us in detail and we'll help you solve it.



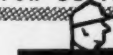
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Build up demand for your feed mixes by adding the blood "builder-upper" minerals—iron and copper! Tamm's is a pioneer in high grade oxides of iron—now also offers manufacturers of feed a unique blend of iron and copper sulphate.

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**new developmental chemicals**  
**733-748**

(Continued from page 79)

esterifications; as blocking agent in delicate organic synthesis. Trifluoroacetyl group hydrolyzes easily; acid-labile groups in anhydride soln are stable. Matheson Coleman.

733) \*TRIFLUOROETHANOL —  $\text{CF}_3\text{CH}_2\text{OH}$  of 98+ % purity. Solvent for nylon, methacrylate, cellulose acetate resins. Makes pharmaceuticals, dyes, insecticides, polymers. MP:  $-43.5^\circ$ . BP:  $74.05^\circ$ . LD<sub>50</sub> (oral) 0.30 gm/kg (mice). Sharples.

734) TRIFLUOROETHYL CHLORIDE —  $\text{CF}_3\text{CH}_2\text{Cl}$  of 98+ % purity is a propellant (aerosols) and refrigerant. Excellent solvent for polar materials. Has high water tolerance. MP:  $-105.5^\circ$ . BP:  $6.93^\circ$ . LCT<sub>100</sub>: 150,000 ppm (mice). Sharples.

735) \*TRIISOPROPYL BORATE — 99.5+ % For making alkylborohydrides and complex borate esters by alcohol interchange. Am. Potash & Chem.

736) \*TRIMETHYLOL ETHANE TRIACETATE — Refined grade. Has high solvent action for cellulose resins. It has lower volatility and is more resistant to hydrolysis than triacetin. BP:  $287-289^\circ$ . Kessler.

737) \*TRIMETHYLOLPROPANE TRIACETATE — An active solvent plasticizer for cellulose resins, it offers lower volatility and greater resistance to hydrolysis than glyceryl triacetate. BP @ 4 mm:  $145-151^\circ$ . Kessler.

738) \*2,2,4-TRIMETHYL-1,3-PENTANEDIOL — Intermediate. Purity: 95+ %. MP:  $49-51^\circ$ . Exp. Eastman C.P.

739) TRIMETHYLPHENYLAMMONIUM BENZENE-SULFONATE — Pract. MP:  $192-194^\circ$ . DPI.

740) \*delta-VALEROLACTONE — BP (2 mm):  $79^\circ$ . Selective solvent, inter. for fibers, polyesters. Exp. Carbide & Carbon.

741) VINYL BUTYRATE — Pract. DPI.

742) VINYL CYCLOHEXENE DIOXIDE — BP:  $222^\circ$ . Intermediate. Can be polymerized alone, forms condensation resins with dicarboxylic acids, monomer for polyglycols containing unreacted epoxy groups. Exp. Carbide & Carbon.

743) VINYL CYCLOHEXENE MONOXIDE — BP:  $169^\circ$ . Copolymerization with epoxides yields unsaturated polyglycols; copolymerization through vinyl group gives epoxide-containing resins capable of further reaction. Exp. Carbide & Carbon.

744) \*XYLYLENE DICHLORIDES — Uses: plasticizers, cosolvents, as intermediates for polyurethans, polymers, specialty plasticizers. Purity: 95+ %. Para isomer has MP:  $98-100^\circ$ , BP:  $240-245^\circ$ , LD<sub>50</sub> (oral): 2.9 gm/kg (mice). Sharples.

745) \*XYLYLENE GLYCOLS —  $\text{HOCH}_2\text{-C}_6\text{H}_4\text{-CH}_2\text{OH}$  is 95+ % pure. Para isomer has MP:  $115.6^\circ$ , LD<sub>50</sub> (oral): 3.6 gm/kg (mice). Uses: cosolvent, making polyesters, polyurethans, polymers, specialty plasticizers. Exp. Sharples.

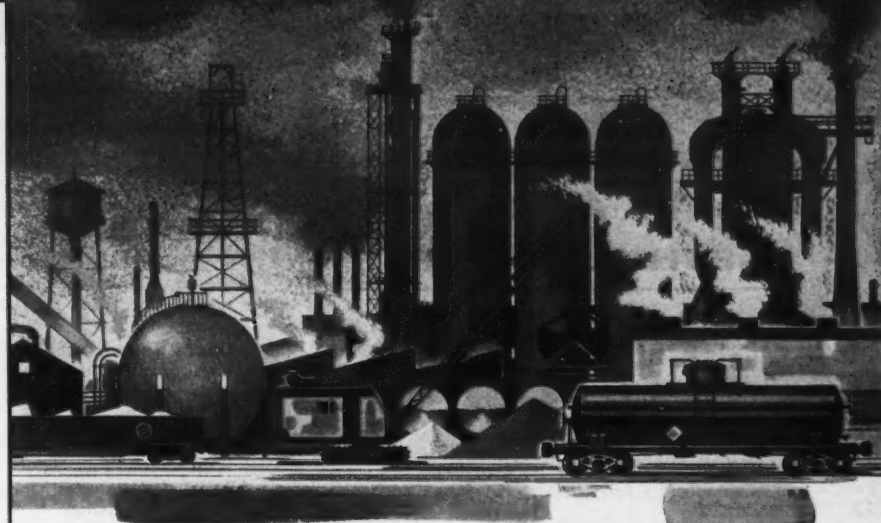
746) 2,4,2,5-XYLENOLS — Mixed isomers. BP:  $208-211^\circ$ . For manufacture of resins, plasticizers, and textile specialties. Carbide & Carbon.

747) ZINC SALICYLATE — Pure white cryst. for pharmaceutical uses. City Chem.

748) \*ZINC DIAMYL DITHIOCARBAMATE — Amyl Ziram is used as a lube oil additive and in rubber processing. MP:  $40^\circ$ . Purity: 98%. Sharples.

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Cosmetic  
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Electrical Manufacturing  
Electroplating  
Enamel  
Engraving and  
Electrotyping  
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Fertilizer  
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Glass  
Insecticide and Fungicide  
Laundry  
Leather  
Lithographing  
Linoleum and Floor  
Covering  
Lubricant  
Match  
Metallurgical  
Metal Working  
Oil Cloth  
Optical  
Paint, Varnish and Lacquer  
Paper  
Petroleum  
Pharmaceutical  
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Porcelain Enamel  
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Pottery  
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Laurate	Coconate	Myristate
Caproate		Palmitate

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In Cincinnati:  
Howard Dock

use this list for locating . . .

**chemical manufacturers**

Here are the full names and addresses of manufacturers of  
the chemical materials described in the listings starting on  
pages 34 and 64. Use this directory when contacting them  
about their products.



Abbott Laboratories, Chemical Sales Div., 14th Street  
and Sheridan Road, North Chicago, Illinois.  
Abco Chemical Company, 2316 Atlantic Avenue,  
Brooklyn 33, N.Y.  
Aceto Chemical Co., Inc., 40-40 Laurence Street,  
Flushing 54, N.Y.  
Acheson Colloids Co., 1635 Washington Ave., Port  
Huron, Mich.  
Acheson Industries, Inc., Acheson Dispersed Pig-  
ments Co. Div., 2250 E. Ontario Street, Phila-  
delphia 34, Pa.  
Advance Solvents & Chemical Corp., 245 Fifth Ave-  
nue, New York 16, N.Y.  
Aldrich Chemical Co., 3747 N. Booth St., Milwaukee  
12, Wis.  
Alframine Corp., 4731 E. 52nd Dr., Los Angeles 22,  
Calif.  
Alkydol Laboratories, Inc., 3242 S. Fiftieth Avenue,  
Cicero 50, Illinois  
American Alcolac Corp., 350 Fifth Ave., New York  
1, N.Y.  
American Chemical Paint Co., Ambler, Pa.  
American Cyanamid Company, 30 Rockefeller Plaza,  
New York 20, N.Y.  
American Cyanamid Company, Textile Resin Dept.,  
Bound Brook, N. J.  
American Potash & Chemical Corp., 3030 W. Sixth  
St., Los Angeles 54, Calif.  
Ansul Chemical Co., 1 Stanton, Marinette, Wis.  
Arapahoe Chemicals, Inc., 2800 Pearl Street, Boulder,  
Colorado  
Archer-Daniels-Midland Co., Chemical Products Divi-  
sion, 2191 W. 110th Street, Cleveland 2, Ohio  
Armour & Company, Chemical Division, 1355 W.  
31st Street, Chicago 9, Illinois  
Arnold, Hoffman & Co. Inc., 55 Canal Street, Provi-  
dence 1, R.I.  
Atlas Powder Co., Chemicals Div. and Food Industry  
Div., Wilmington 99, Del.  
Bakelite Company, Div. of Union Carbide & Carbon  
Corp., 260 Madison Ave., New York 17, N.Y.  
Baker Castor Oil Co., 120 Broadway, New York 5,  
N.Y.  
Barrett Division, Allied Chemical & Dye Corp., 40  
Rector Street, New York 6, N.Y.  
Becco Chemical Division, Food Machinery & Chemi-  
cal Corp., 34 Sawyer Avenue, Buffalo 7, N.Y.  
The Borden Company, Chemical Division, 350 Madi-  
son Avenue, New York 17, N.Y.  
The Borden Company, Chemical Division, Resinous-  
Reslac Dept., 103 Foster Street, Peabody, Mass.  
Brown-Allen Chemicals, 2581 Richmond Terrace,  
Staten Island 1, N.Y.

By-Products Processing Laboratories, Inc., 1650  
Broadway, New York 19, N.Y.  
Godfrey L. Cabot, Inc., 77 Franklin Street, Boston  
10, Mass.  
Carbide & Carbon Chemicals Co., Div. of Union  
Carbide & Carbon Corp., 30 E. 42nd Street, New  
York 17, N.Y.  
Carbon Dispersions Inc., 27 Haynes Avenue, Newark  
5, N.J.  
Cargill, Inc., 200 Grain Exchange Bldg., Minneapolis  
15, Minn.  
Carlisle Chemical Works, Inc., Reading, Ohio  
Carolina Aniline & Extract Co., 301 S. Cedar Street,  
Charlotte 1, N.C.  
Celanese Corp. Of America, Chemical Division, 180  
Madison Avenue, New York 16, N.Y.  
Chase Chemical Corporation, 3527 Smallman Street,  
Pittsburgh 1, Pa.  
Chemical Process Company, 1901 Spring Street,  
Redwood City, Calif.  
Chemo Puro Manufacturing Corp., 150 Doremus  
Avenue, Newark 5, N.J.  
City Chemical Corporation, 132 W. 22nd Street, New  
York 11, N.Y.  
Climax Molybdenum Company, 500 Fifth Avenue,  
New York 36, N.Y.  
Columbia-Southern Chemical Corp., Sub. of Pitts-  
burgh Plate Glass Co., 1 Gateway Center, Pitts-  
burgh 22, Pa.  
Commercial Solvents Corp., 260 Madison Avenue,  
New York 16, N.Y.  
Continental Oil Company, Petrochemical Dept., 630  
Fifth Avenue, New York 20, N.Y.  
Corn Products Sales Co., 17 Battery Place, New  
York 4, N.Y.  
Dacar Chemical Products Co., 1007 McCartney,  
Pittsburgh 20, Pa.  
Dajac Laboratories, Chemical Division, The Borden  
Company, 511 Lancaster Street, Leominster, Mass.  
Davison Chemical Company, Div. of W.R. Grace  
& Co., Baltimore 3, Md.  
Dearborn Chemical Company, Merchandise Mart  
Plaza, Chicago 54, Illinois  
Dexter Chemical Corp., 819 Edgewater Rd., New  
York 59, N.Y.  
Diamond Alkali Company, Chlorinated Products  
Div., 300 Union Commerce Bldg., Cleveland 14,  
Ohio  
Distillation Products Industries, Div. of Eastman  
Kodak Co., 343 State Street, Rochester 3, N.Y.  
The Dow Chemical Co., Midland, Michigan  
Dow Corning Corporation, Midland, Michigan  
E. I. du Pont de Nemours & Co., (Inc.), Explosives

When inquiring check CP 4680 opposite last page



Dept., and Grasselli Chemicals Dept., Wilmington 98, Del.

Eastern Chemical Corp., 34 Spring Street, Newark 4, N.J.

Eastman Chemical Products, Inc., 260 Madison Avenue, New York 16, N.Y.

Emery Industries, Inc., 4200 Carew Tower, Cincinnati 2, Ohio

The Emulsol Corporation, Div. of Witco Chemical Co., 59 E. Madison Street, Chicago 3, Ill.

Enjay Company Inc., 570 N. Broad St., Elizabeth, N.J.

Evans Chemetics, Inc., 250 E. 43rd Street, New York 17, N.Y.

Fallek Products Co., Inc., 165 Broadway, New York 6, N.Y.

Farnow, Inc., 4-83 48th Ave., Long Is. City 1, N.Y.

Federal Adhesives Corp., 210-220 Wythe Ave., Brooklyn 11, N.Y.

Fine Organics, Inc., 205 Main Street, Lodi, N.J.

Fisher Scientific Co., 717 Forbes Street, Pittsburgh 19, Pa.

Foremost Food & Chemical Co., El Dorado Div., PO Box 599, Oakland 4, Calif.

Geigy Agricultural Chemicals, 89 Barclay St., New York 8, N.Y.

General Aniline & Film Corp., Dyestuff & Chemical Div., 435 Hudson St., New York 14, N.Y.

General Electric Company, Chemical & Metallurgical Div., and Silicone Products Dept., Mechanicville Road, Waterford, N.Y.

General Mills, Inc., 2010 E. Hennepin Ave., Minneapolis 13, Minn.

General Mills, Inc., Chemical Div., S. Kensington Road, Kankakee, Ill.

The Girdler Co., Catalyst Dept., 224 E. Broadway, Louisville 1, Ky.

Givaudan-Delawanna, Inc., 330 W. 42nd Street, New York 36, N.Y.

Glyco Products Co., Inc., Empire State Bldg., New York 1, N.Y.

B. F. Goodrich Chemical Co., 2060 E. Ninth St., Cleveland 15, Ohio

Goodrich-Gulf Chemicals, Inc., 3121 Euclid Ave., Cleveland 15, Ohio

The Goodyear Tire & Rubber Co., Inc., Chemical Division, Akron 16, Ohio

Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio

Hercules Powder Co., Inc., Wilmington 99, Del.

Hooker Electrochemical Co., Buffalo Ave., Niagara Falls, N.Y.

J.M. Huber Corp., 100 Park Ave., New York 17, N.Y.

Interchemical Corp., Finishes Div., 1754 Dana Ave., Cincinnati 7, Ohio

International Minerals & Chemical Corp., 20 N. Wacker Drive, Chicago 6, Ill.

Isocyanate Products, Inc., 900 Wilmington Road, New Castle, Del.

Jasonols Chemical Corp., 825 E. 42nd St., Brooklyn 10, N.Y.

Jefferson Chemical Co., Inc., PO Box 303, Houston 1, Texas

Johns-Manville Products Corp., 22 E. 40th Street, New York 16, N.Y.

Kay-Fries Chemicals, Inc., 180 Madison Ave., New York 16, N.Y.

Kelco Company, 120 Broadway, New York 5, N.Y.

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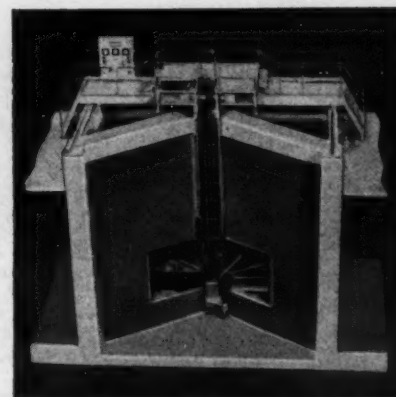
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Harvester, Chicago Screw Co.

## MATERIALS

### Chemical Manufacturers

(Continued from preceding page)

The M. W. Kellogg Co., PO Box 469, Jersey City 3, N.J.

Kessler Chemical Co., Inc., State Road & Cottman Ave., Philadelphia 35, Pa.

Kolker Chemical Corp., 600 Doremus Ave., Newark 5, N.J.

Koppers Company, Inc., Koppers Bldg., Pittsburgh 19, Pa.

Krishell Laboratories, Inc., 1735 S.E. Powell Blvd., Portland 2, Ore.

Lamotte Chemical Products Co., Towson 4, Md.

Mallinckrodt Chemical Works, 2nd & Mallinckrodt Sts., St. Louis 7, Mo.

Marbon Chemical, Div. of Borg-Warner Corp., 1926 W. 10th Ave., Gary, Indiana

Matheson Coleman & Bell, Div. of The Matheson Co., Inc., East Rutherford, N.J.

Millmaster Chemical Corp., 295 Madison Ave., New York 17, N.Y.

Minnesota Mining & Mfg. Co., 900 Fauquier Ave., St. Paul 6, Minn.

Mobay Chemical Company, 1700 S. Second Street, St. Louis 4, Mo.

Mona Industries, Inc., Paterson 4, N.J.

Monsanto Chemical Company, Organic Chemicals Div., 800 N. Twelfth Blvd., St. Louis 1, Mo.

Monsanto Chemical Company, Plastics Division, 812 Monsanto Ave., Springfield 2, Mass.

Moretex Chemical Products, 314 W. Henry St., Spartanburg, S.C.

Mutual Chemical Division, Allied Chemical & Dye Corp., 99 Park Ave., New York 16, N.Y.

National Aluminate Corp., 6294 W. 66th Place, Chicago 38, Ill.

National Aniline Div., Allied Chemical & Dye Corp., 40 Rector Street, New York 6, N.Y.

National Lead Co., 111 Broadway, New York 6, N.Y.

National Starch Products, Inc., 270 Madison Ave., New York 16, N.Y.

Neville Chemical Co., Neville Is., Pittsburgh 25, Pa.

New Jersey Zinc Company, 160 Front Street, New York 38, N.Y.

Ninol Laboratories, Inc., 1719 S. Clinton Street, Chicago 16, Illinois

Nitrogen Division, Allied Chemical & Dye Corp., 40 Rector Street, New York 6, N.Y.

Nopco Chemical Co., Inc., Harrison, N.J.

Ohio-Apex Division, Food Machinery & Chemical Corp., Nitro, W. Va.

Olin Mathieson Chemical Corp., 460 Park Ave., New York 22, N.Y.

Onyx Oil & Chemical Co., Warren and Morris Sts., Jersey City 2, N.J.

Oronite Chemical Co., 200 Bush Street, San Francisco 20, Calif.

Pacific Coast Borax Co., Div. of Borax Consolidated, Ltd., 100 Park Ave., New York 17, N.Y.

The Pacific Lumber Co., 100 Bush Street, San Francisco 4, Calif.

Pan American Chemicals Corp., 555 Fifth Avenue, New York 17, N.Y.

Pennsylvania Salt Mfg. Co. of Washington, 2901 Taylor Way, Tacoma 1, Wash.

The Permutit Co., 330 W. 42nd St., New York 36, N.Y.



## MATERIALS

### Chemical Manufacturers

(Concluded)

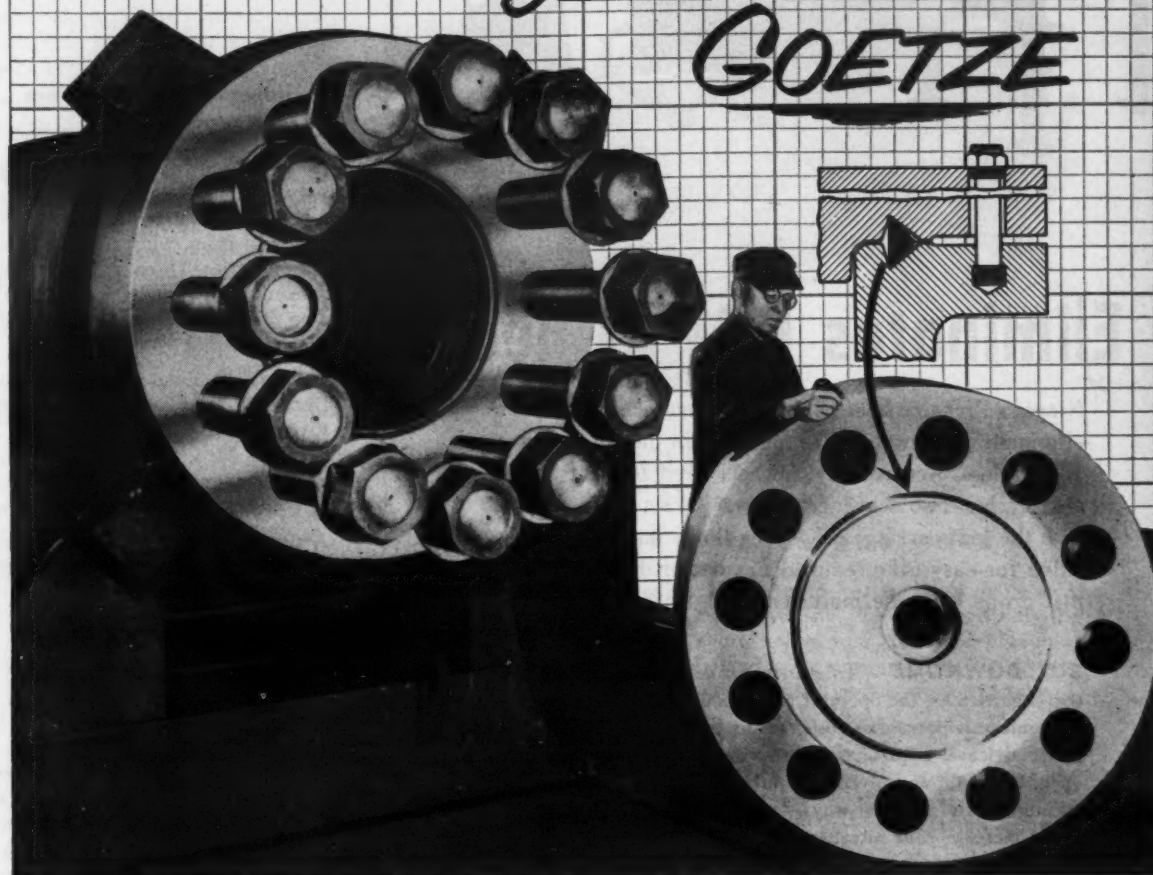
- Chas. Pfizer & Co., Inc., 630 Flushing Ave., Brooklyn 6, N.Y.  
 Philadelphia Quartz Co., Public Ledger Bldg., Philadelphia 6, Pa.  
 Polak's Frutal Works, Inc., 33 Sprague Ave., Middletown, N.Y.  
 Raymond Laboratories, Inc., 261 E. Fifth St., St. Paul 1, Minn.  
 Reichhold Chemicals, Inc., 525 N. Broadway, White Plains, N.Y.  
 Reilly Tar & Chemical Corp., 1615 Merchant Bank Bldg., Indianapolis 4, Ind.  
 Reynolds Metals Co., 2500 S. Third St., Louisville 1, Ky.  
 Rhode Island Laboratories, Inc., 100 Pulaski St., West Warwick, R.I.  
 Rhodia, Inc., 230 Park Ave., New York 17, N.Y.  
 Rohm & Haas Co., Textile Chemicals Dept. and Special Products Dept., Washington Square, Philadelphia 5, Pa.  
 Rubber Corporation of America, New South Road, Hicksville, N.Y.  
 Schwarz Laboratories, Inc., 230 Washington St., Mount Vernon, N.Y.  
 Semet-Solvay Petrochemical Div., Allied Chemical & Dye Corp., 40 Rector Street, New York 6, N.Y.  
 The Sherwin-Williams Co., Pigment, Color and Chemical Div., 260 Madison Ave., New York 16, N.Y.  
 Sharples Chemicals Div., Pennsylvania Salt Mfg. Co., 3 Penn Center Plaza, Philadelphia 2, Pa.  
 Shell Chemical Co., 50 W. 50th Street, New York 20, N.Y.  
 Soluble Products Co., 360 Furman St., Brooklyn 1, N.Y.  
 Stauffer Chemical Co., 380 Madison Ave., New York 17, N.Y.  
 Stepan Chemical Co., 20 N. Wacker Dr., Chicago 6, Ill.  
 Sumner Chemical Co., 8 E. 45th Street, New York 17, N.Y.  
 Sun Oil Company, Philadelphia 3, Pa.  
 Swift & Company, Industrial Oil Dept., 1800 165th St., Hammond, Ind.  
 Thiokol Corporation, 780 N. Clinton Ave., Trenton 7, N.J.  
 I. P. Thomas Div., Pennsylvania Salt Mfg. Co., 3 Penn Center Plaza, Philadelphia 2, Pa.  
 Joseph Turner & Co., Ridgefield, N.J.  
 Union Bay State Chemical Co., Inc., 491 Main Street, Cambridge 42, Mass.  
 Union Carbide & Carbon Corp., Silicones Division, 30 E. 42nd Street, New York 17, N.Y.  
 U.S. Industrial Chemicals Co., Div. of National Distillers Products Corp., 99 Park Ave., New York 16, N.Y.  
 Wallace & Tiernan, Inc., Harchem Division, 25 Main Street, Belleville, N.J.  
 Warwick Chemical Co., Div. of Sun Chemical Corp., Wood River Junction, R.I.  
 West Virginia Pulp & Paper Co., Polychemicals Div., Charleston 4, S. C.  
 Witco Chemical Co., 6200 W. 51st Street, Chicago 38, Ill.  
 Wyandotte Chemicals Corp., Wyandotte, Michigan

**PRESSURE: 15,000 PSI**

**TEMPERATURE: 450 F**

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illustrated above, which was designed, for this application, to withstand pressures up to 15,000 psi. and temperatures to 500 F.

The development of special gaskets to meet special purposes has been the stock in trade of Johns-Manville's Goetze division for more than sixty-five years. Expert technicians possess a knowledge of metals and other factors related to gasket design and performance that is unmatched in the field. What's more, intensive specialization and modern production tooling

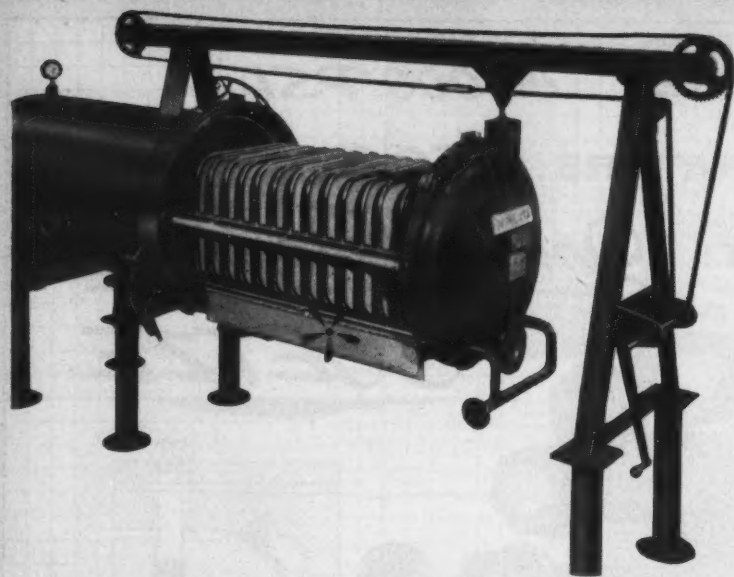
provide substantial cost savings on J-M gaskets.

If you need gaskets for high pressure vessels for similar applications, send us a drawing or template for quotation. If you have a sealing problem of any kind, J-M technicians will work directly with your own engineers to develop new gaskets—or adapt existing styles—to meet your specific requirements. Write for further information to Johns-Manville, Box 60, New York 16, N. Y. In Canada, Port Credit (Toronto), Ontario.



**Johns-Manville PACKINGS & GASKETS**

When inquiring check CP 4682 opposite last page



## Eliminates 99% of heel

\* **Niagara Pressure Leaf Filters** with *new scavenger leaves* eliminate unfiltered liquid heel left in the filter tank to 1% or less. Accordingly, no heel need be held for the next cycle. Two scavenger leaves retract from the tank with the leaf carriage . . . swing down into a vertical position for easy cake removal . . . out of the way of cake that drops from the main leaves.

**CUT DOWNTIME**—To remove cake from the main and scavenger leaves, the operator simply shakes or taps them; cake falls into a hopper. For the great majority of applications, the all-metal leaves require no fabric covers. One man can drain, open, clean, fill and precoat in minutes . . . not hours. Sharply cutting downtime this way—plus greater flow rates—can easily increase your filtration efficiency as much as 400% over cloth-covered presses.

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## EXPANDING CHEMICAL PRODUCTION



### Spending 16 million dollars for gas expansion

Air Reduction's gas expansion program, designed to make rare gases less rare and to supply greatly increased demand for industrial gases, will cost 16 million dollars during 1956. Three producing plants are scheduled for completion this year; at Chicago, Illinois; Alton, Illinois; and Calvert City, Kentucky.

Producing facilities will also be installed at Butler, Pa., and output will be increased at Riverton, N. J. Plants at Butler, Pa., and Riverton, N. J. are the largest Airco plants producing liquid and gaseous oxygen, nitrogen, argon, neon, krypton, and xenon.

A portion of the 16 million dollars will be spent on expansion of gas producing facilities in the Southwest.

### Versatile organic isocyanates — 25 million pounds

Large scale production of organic isocyanates is planned at Du Pont's plant at Deepwater Point, N. J. Capacity of this plant (located at the Chambers Works) is 25 million pounds per year. The plant is now in production.

Organic isocyanates are rubber-like or plastic-like materials ranging from rigid and flexible foams to an experimental synthetic rubber for automobile tires.

### Synthetic rubber plant will be built

First complete synthetic rubber plant to be built since World War II will be constructed near Odessa, Texas by General Tire & Rubber Co. and El Paso Natural Gas Co. Cost will be approximately \$28 million. Construction is scheduled to begin immediately, and production of synthetic rubber is expected to start about July 1, 1957.

Capacity of the plant will be approximately 40,000 long tons of GR-S synthetic rubber annually. Raw materials will be butadiene and styrene. El Paso Natural Gas will build and operate the butadiene and styrene producing units. General Tire will build and operate the copolymer plant.

Existing synthetic rubber plants in the country were built by the Government during the war. Most of them were sold early in 1955 to private companies. General Tire bid for a GR-S plant at Baytown, Texas was rejected as too low.

### Shell's fourth MEK plant to start up in '57

Construction on Shell Chemical Company's fourth methyl ethyl ketone plant has already started at Norco, Louisiana. Capacity will be forty million pounds per year. Production will begin early in 1957. MEK is used in surface coating and vinyl resin industries, and also as a chemical intermediate. Shell's other MEK plants are at Houston, Texas, and Martinez and Dominguez, California.

Construction of Shell Chemical's resin development facilities at Houston, Texas, has been running ahead of schedule. Unit will provide market development quantities of resins and related products. It is now expected to be in operation by the end of April.

### Monsanto jumps captive output of melamine

Melamine facilities of Monsanto Chemical Company at Everett, Mass., are being consolidated and modified to allow increased production. The changes will be completed by the end of May. Entire output of the plant is used by Monsanto in production of melamine resins for decorative laminating, surface coating, textile and paper industries.



## News about chemical materials in the US — plant construction, increased production . . . on stream now or planned for future

### **Buys titanium mineral rights —will process ore**

Metal & Thermit Corporation has purchased an 800-acre tract in Hanover County, Virginia, near Montpelier for mining and processing titanium-bearing ore. Plant and equipment are expected to cost about three quarters of a million dollars. Construction will start during the spring of 1956 and will be completed in the fall. Both rutile,  $TiO_2$ , and ilmenite,  $FeTiO_3$ , will be produced. Conventional gravity ore dressing process will be used with magnetic separation.

### **Studying additional facilities for nylon and Orlon**

Projects have been initiated by the DuPont Company to determine possibilities of locating a large nylon plant in Richmond, Va., and an Orlon plant in Waynesboro, Va.

DuPont estimates that the Richmond plant, if built, will produce over 35 million pounds of heavy-denier nylon annually for use in tire cord and industrial products. The Waynesboro plant, if built, will have a production rate of approximately 40 million pounds of Orlon annually.

DuPont has also purchased 900 acres near Maysville, Ky., for future construction of a general-purpose chemical plant. Site is four miles west of Maysville on the Ohio River, and about 65 miles east of Cincinnati, Ohio.

### **Dow to expand two plants and build a new one**

The Dow Chemical Company is increasing its synthetic glycerine production capacity at its Texas Division facilities. Satisfactory operation of the company's plant at Velasco, Texas, plus the steadily increasing demand for synthetic glycerine prompted the decision to increase capacity.

More ethylene oxide, 30 million pounds per year, will be available at Dow's Texas Division at Freeport, Texas, upon completion

of an expansion program in late 1956. Latest expansion is in addition to a 60 million pound per year increase in ethylene oxide-glycol capacity announced in 1955.

Dow also plans to spend 20 million dollars in the Baton Rouge area of Louisiana for facilities to produce chlorine, caustic soda, and several organic chemicals. Dow has taken options on land located on the West bank of the Mississippi River. Plans for the Louisiana operation are in line with the company's effort to decentralize future expansion where economically feasible.

### **Ties fertilizer production to acid plant**

Ammonium phosphate fertilizer plant costing over a million dollars will be built by Ozark-Mahoning Company next to its sulfuric acid plant at Tulsa, Okla. Capacity of the fertilizer facilities will be about 50,000 tons annually of high analysis water soluble complex fertilizers. Ozark-Mahoning has been producing sulfuric acid in Tulsa for the past thirty years. Large quantities of the acid will be used in the fertilizer plant.

### **Adipic acid & phthalic anhydride — more in 1957**

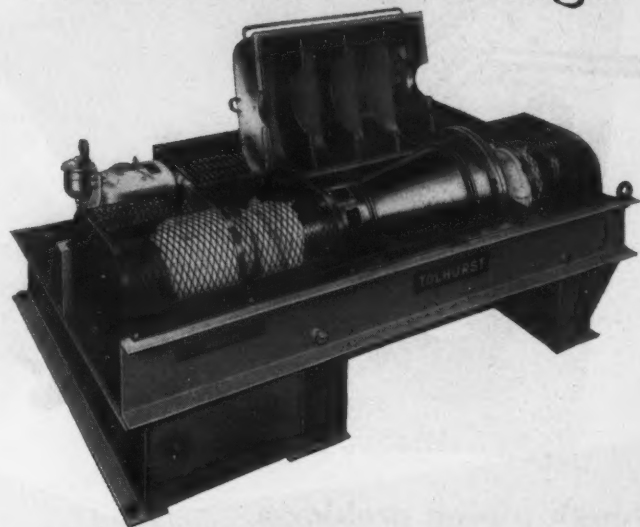
Monsanto Chemical Company is expanding production of adipic acid and phthalic anhydride. Facilities for both products will be completed early in 1957.

Adipic acid will be produced at Luling, La., at the Barton plant of Lion Oil Company, a division of Monsanto. Cost of the unit is expected to be several million dollars. Raw materials will be supplied by the Lion facilities. Use of adipic acid is rapidly expanding for manufacture of flexible polyurethane foams.

Monsanto's plant at Everett, Mass., for phthalic anhydride will be expanded by 60%. Monsanto anticipates a substantial growth in demand for the material. Part of the expanded output is expected to be used in the plant's phthalate ester production.

(Please turn to next page)

## new model continuous centrifugal



### **EASILY ADJUSTED for maximum throughput . . . quality of filtrate and cake**

You can quickly adjust Maxi-Flex<sup>®</sup> for percentage of solids, cake resistance and mother liquor viscosity. You can easily vary the centrifugal force field and length of time solids and liquid are under centrifugal force. And you can even adjust for dryness of cake and clarity of filtrate as well as best discharge rates.

Adjust for all these factors by simply turning a handwheel on the Vari-Beach drive . . . or by rotating four Vari-Pool orifice plates . . . or by making a 20-minute alteration to vary the centrifugal force. In fact, Maxi-Flex is the only continuous centrifugal of this large capacity to develop 2000 times gravity.

Yes, it's the *adjustability* that enables Maxi-Flex to give more speed and efficiency to your present separations. Maxi-Flex also adapts easily to changes in material characteristics, and to entirely new and different materials.

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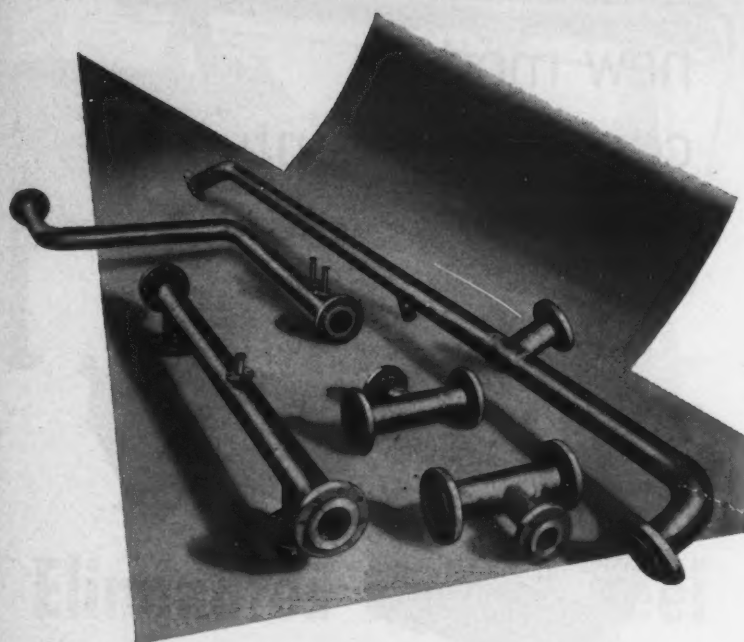
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## Tough piping problems made easier with **AMPCO\* PIPE**

... the pipe that resists corrosion and velocity damage,  
withstands mechanical abuse

Put Ampco Pipe on your tough, liquid-handling jobs, and, mister, you've got something. First of all you've got pipe that's easier and less costly to install. It stands up under wrenches and hammers without thread distortion and subsequent leakage. It is readily welded with shielded arc procedures. "On-the-job" changes and maintenance may be done by the average welder.

Pipe made from this unique aluminum-bronze alloy is hard, yet it's unusually tough — gives you Brinell hardnesses of 150 and tensiles up to 70,000 psi. It has high strength-to-weight ratios.

But here's the best part of the story. It is highly resistant to many acids and caustics. It has high velocity tolerance—permits flow rates up to 18-20 fps. It withstands the action of abrasive solids in suspension and resists cavitation-pitting. It combines the advantages of many different pipe materials without their drawbacks.

What's more, you can get Ampco Pipe in all standard sizes, many from stock. Fittings are also available to 3600 psi and flanges to 5000 psi. Write us now for full information.



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Genuine Ampco Metal

### AMPCO METAL, INC.

Dept. CP-4, Milwaukee 46, Wisconsin

West Coast Plant  
Burbank, California

\*Reg. U. S. Pat. Off.

PR-19

When inquiring check CP 4685 opposite last page

## EXPANDING CHEMICAL PRODUCTION

(Continued from preceding page)

### Ammonia plant completed — now for PVC unit

Escambia Bay Chemical Corporation is already shipping ammonium nitrate solution from its plant at Pensacola, Fla. Ground was broken on April 29, 1955. Production started on December 28, 1955. With completion of the ammonia plant, Escambia has let contracts for construction of a polyvinyl chloride resin plant. Capacity will be 30 million pounds per year. Completion is expected late in 1956.

### Will increase production of resorcinol

Heavy demand for resorcinol has caused Koppers Company, Inc., to plan a 40% increase in production. Expansion plans require addition of new facilities, equipment, and renovating some existing buildings at the Petrolia, Pa., plant. Resorcinol is used by the rubber industry in treatment of tire cord. Other uses are in making of dyes, pharmaceuticals, leather, adhesives.

### Phillips licenses process for polyolefins

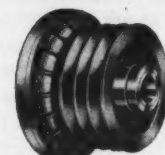
Phillips Petroleum Company has signed license agreements with W. R. Grace & Co. and Pullman, Inc. to allow production of polyolefin plastics.

Grace project involves construction of a million dollar semi-works plant for polyethylene and other polymers, expected to go into operation this summer, together with erection of a large plant for commercial production of polyethylene. Second plant is expected to be on stream by mid-1957.

Design capacity of the plant will be 50 million pounds a year. Basic raw material, ethylene, used in the process will be supplied to the Grace installation by an Esso Standard Oil Company refinery.

The M. W. Kellogg Co., subsidiary of Pullman, Inc., will operate production facilities, when completed in approximately 18 to 24 months.

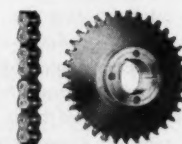
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6200 Union Street • Mishawaka, Indiana

**DODGE**

of Mishawaka, Ind.

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opposite last page

CHEMICAL PROCESSING



## EXPANDING CHEMICAL PRODUCTION

### Boosts phosphate capacity at Bartow, Florida

Four million dollars has been appropriated by International Minerals and Chemicals Corporation to double production capacity of its Bonnie plant near Bartow, Fla. Program is to include construction of a second sulfuric acid plant and equipment for neutralization and recovery of plant effluents. After expansion, capacity for manufacturing triple superphosphate and feed grade dicalcium phosphate will be 500,000 tons annually.

### Has started engineering studies for Springhill, La., plant

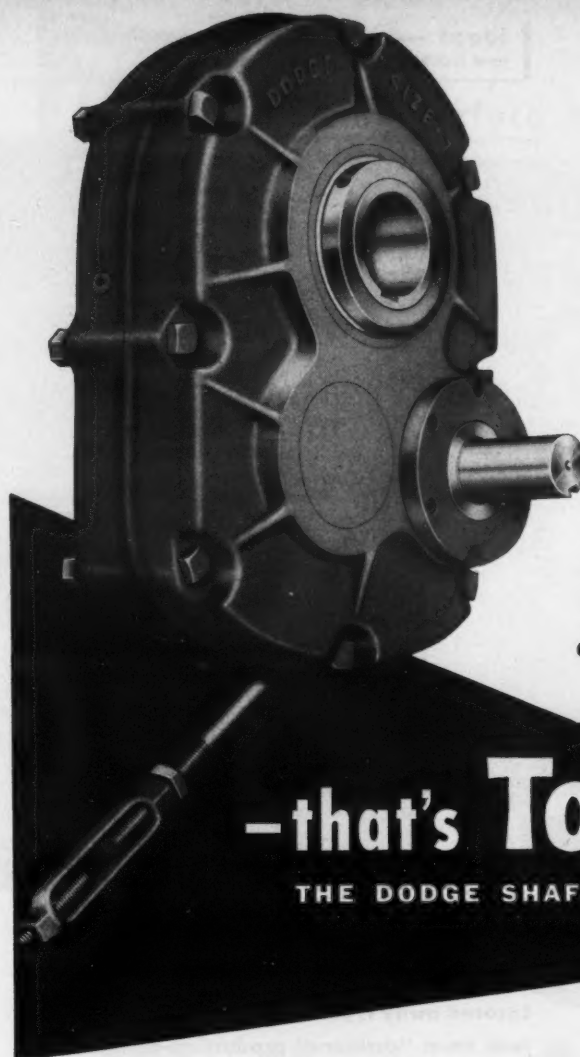
Arizona Chemical Company, jointly owned by American Cyanamid Company and International Paper Company, has begun engineering studies for a tall oil fractionating unit to be located at Springhill, La.

Tall oil products are derived from spent black liquor residues resulting when Southern pine is made into Kraft pulp. Arizona Chemical just completed (in June, 1955) a 2½ times expansion of Panama City, Florida, facilities for tall oil products.

### Boosting titanium output of mine and mill

Expansion of 25 percent in capacity of ilmenite mine and mill at Tahawus, N.Y., will be completed during 1956 by National Lead Company. Tahawus operation is the largest of its kind in the world. Expansion means a fifth production line will be added to the mill, where this titanium ore is concentrated, and another shift will be added to the mine operations.

National Lead has proven reserves of 50 million tons. A recent ore discovery has indicated that an additional 100 million tons are available. Ore is shipped to National Lead's titanium pigment plants in Sayreville, N. J. and St. Louis, Mo. The pigments find use in paints, paper, rubber, plastics, floor and roof coverings.



# 97%

## EFFICIENCY

- NO FOUNDATION
- NO FLEXIBLE COUPLING
- NO SLIDING BASE
- NO LINING UP PROBLEM

# -that's Torque-Arm

THE DODGE SHAFT-MOUNTED SPEED REDUCER

Proved in tens of thousands of installations, in all types of industry, this new and better kind of speed reducer delivers up to 97% efficiency... makes savings up to one-third!

Mounted directly on the driven shaft, the reducer is anchored by the Torque-Arm, fastened to any fixed object. No need for foundation, flexible coupling or sliding base. No lining up difficulties. Unit is driven through any V-belt drive.

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Dodge Torque-Arm is America's most complete line of shaft-mounted speed reducers — single and double reduction series—capacities from 1 hp to 60 hp; output speeds of 12 to 365 rpm. Sold from Distributors' stocks.

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Call the Transmissioneer, your local Dodge Distributor. He can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified phone book, or write us.



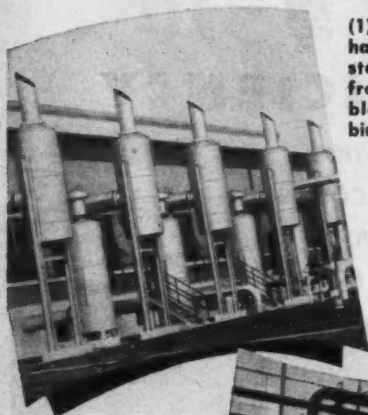
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of Mishawaka, Ind.

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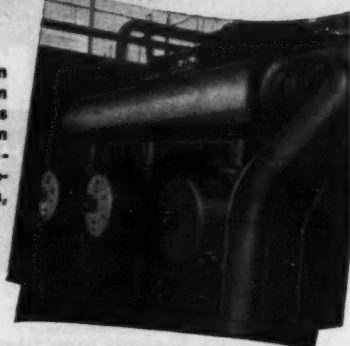
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is analyzing and  
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(2) Piping pulsation and vibration caused by surges emanating from pumping equipment, pressure reduction operations, etc.



We have incorporated, in the tried and proved Burgess-Manning Snubber, the science of pulse and slug arresting that has saved industry many dollars in increased production, decreased maintenance, elimination of compensation claims and improved public and employee relations.

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Let us tell you how Burgess-Manning Snubbers will solve your problems of Noise and Pulsation.

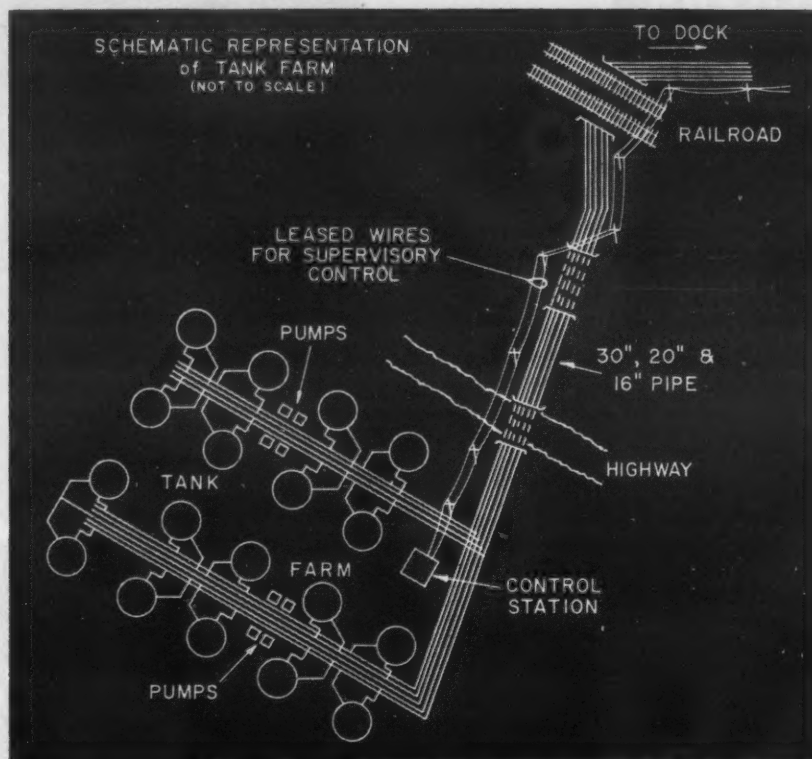
Write for literature and  
free case history material



**BURGESS-MANNING COMPANY**

Sound Engineering 721 East Park Avenue, Libertyville, Illinois  
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**Ideas** — from other industries and nuclear field . . .  
new trends in research, processes, services



Located away from main refining area, added tank farm "cushions" production-demand inequities. Supervisory system allows Esso to . . .

## operate tank farm with remote control

Decision to build a 2.7-million barrel tank farm near Esso's Bayway Refinery in New Jersey was made during the winter of 1951-52. Demand for domestic heating oil that winter strained local facilities to the utmost. A few tankers, in fact, brought oil from other refineries to ease local supply. Esso was having an exceptionally rugged time with the refinery/market problem of high gasoline demand in the summer, high heating oil demand in the winter.

Plans to have 16 of the 18 tanks ready by the winter of 1953-54 were met. Tank farm includes a control point and has an auxiliary control point located at

the loading dock. Between these two, a four-mile pipe runs (50,000 feet of 30, 20, and 16" pipe, in all) and serves to handle material going either way. Some of this piping was existent, remainder was installed with the farm.

These pipes were all run above ground. Studies showed that local corrosion conditions could be met better in this way. Faster construction was an added advantage.

By using a supervisory control system (pulse relays, etc.) operated over a pair of leased telephone lines, four 300-hp pumps and four motor-operated valves

When inquiring check CP 4688 opposite last page

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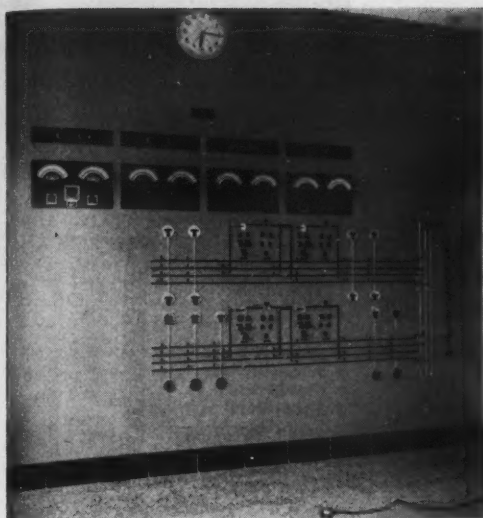
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Graphic panel in tank farm control station shows part of piping layout, level in tanks

can be controlled from the control point at the waterfront.

In loading a barge, one man at the tank farm checks tank levels and selects a tank to be drawn from. He sets valve manifold at the tank farm to take oil from that tank. Operator at the dock can phone any time (using same wires as the control system) to see whether pumping can go ahead. When okay comes in on this, he pushes a button which starts pump motor and opens pump discharge valve.

While farm has not had to be used for unloading any barges since it was constructed, it has been used to conveniently load them. In service, two tanks are set to drain in loading barges—hence fifteen 25,000-barrel barges are loaded from one pumping setup.

Safety precautions in this system allow operator at dock to note changes in motor operation or valve operation at the farm. In event of motor failure, he is immediately warned.

(With the exception of tankage, project was designed, engineered, and constructed by The Kuljian Corp. in conjunction with Esso engineers. More information is available from The Kuljian Corp., Dept. CP, 1200 N. Broad St., Philadelphia 21, Pa. . . . or check CP 4689 on convenient form which is located opposite last page.)

The alphabetical Product Directory (starting on page 225) will give you a page reference to all articles and advertisements in this issue

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Cooling Surface in these deep-ribbed **MOTORS**



No Day is



with these **Allis-Chalmers**  
**MOTORS**

● Frying of insulation is impossible under normal conditions with the extra-large cooling surface of Allis-Chalmers rib-type TEFC motors. The result—you expect and get longer motor life.

The engineered partner of A-C motors is Allis-Chalmers control.

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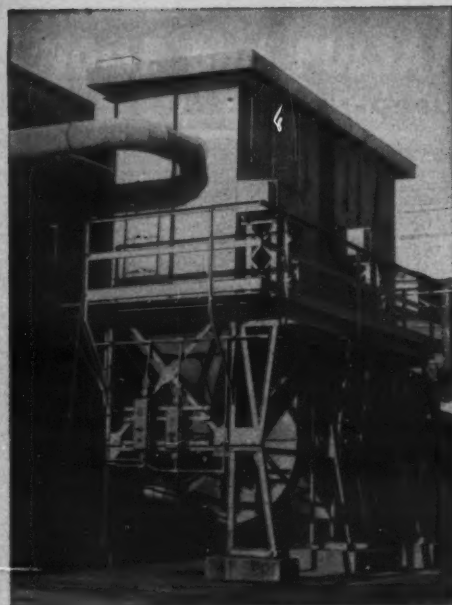
As a new machinery component or as replacement, specify Allis-Chalmers. Discuss your particular application with your nearby A-C distributor, A-C district office, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

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A-4853

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Sly Dust Filter at the plant of Merck & Co., Inc., Rahway, New Jersey.

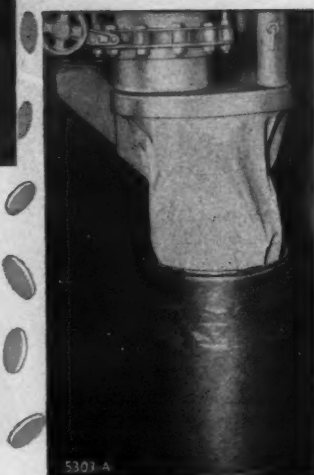


Merck & Co., Inc. uses Sly Dust Filters to maintain quality of product and manufacturing efficiency in the processing of vitamin mixtures.

The final ground powders are blended, milled, sifted and subdivided. Dust tends to escape from each operation. By the use of proper hooding of dust sources the dust is drawn into Sly Dust Collector. About 1.10 to 1.25 percent of each mixture is recovered and reused.

During the past ten years Merck has installed 21 Sly Dust Filters—a fine tribute from a fine company.

No matter what you make or process—if there's dust, you need Sly.



Packaging Unit showing exhaust duct connected to Sly Dust Filter.



Manufacturers of: Dust Control Systems, Blast Cleaning Equipment, Tumbling Mills, Industrial Ovens.

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**PIONEERS AND LEADERS IN INDUSTRIAL DUST CONTROL**

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## IDEAS

### Aluminum alloy casting speeded, improved by continuous melting process . . .

radiant gas-fired tunnel furnaces cut fuel costs, handle 1500 to 2500 lb aluminum per hr

Continuous in-line melting of aluminum alloys for casting is resulting in faster production, better products, lower fuel costs, and improved working conditions at Monarch Aluminum Manufacturing Company, Cleveland, Ohio. Installation is reported to be first of its kind in this field.

Heart of the process are three continuous-melting tunnel furnaces, individually rated at 1500 to 2500 lb per hr, at 1400°F pouring temperature. Developed jointly by Monarch Aluminum and Sels Corporation of America, furnaces utilize the Gradation heating principle, already used in foundry field in batch melting of magnesium, curing shell molds, drying



Operator checks automatic loading of five-ingot charges of aluminum into continuous-melt furnace

green sand molds. Furnaces have radiant gas burners operating at high temperatures to effect fast, controlled heat transfer. Natural gas and air are fed in controlled proportions and pressure to burners.

Mixture is burned within the cups, heating their ceramic lining to incandescence. Heat transfer occurs between the cup and the aluminum charge largely by radiation, bringing the aluminum quickly to the melting point. Up to 60 burners are located in the 10' x 3' roof of the furnace over the final 1/3 of ingot travel. Combustion products provide preheat during the first 2/3 of ingot travel.

Since there is no aluminum in the furnace in a fully liquid state, except in the immediate vicinity of the pour point, there is no chance for the formation of oxides. Each ingot fed into furnace is already covered with a natural oxide coating. Coating does not melt but moves down to lower area of furnace where it is held back as the molten metal flows off underneath. Operator can remove the collected oxide films at regular intervals.

## Uniform Class 3 Fit BOLTS NUTS STUDS

### TITANIUM

- Carbon Steel
- Alloy Steels
- Stainless Steels
- Silicon Bronze
- Naval Brass
- Monel Metal

You can depend on a uniform Class 3 fit if required when you buy Pawtucket threaded fasteners. Standard items or specialties—all Pawtucket products are accurately made in standard dimensions or to your specifications. Heat treating with precision-controlled modern equipment.



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327 Pine St. • Pawtucket, R. I.  
THE PLACE TO SOLVE YOUR BOLT PROBLEMS  
T.M. REG.  
The Bolt Man

When inquiring check CP 4692 opposite last page

CHEMICAL PROCESSING



Furnaces can be shut down within matter of minutes. They can be restarted and brought up to melting temperature in less than three hours — in many cases (when a production delay occurs) less than an hour.

Performance records show an overall gas consumption of 1.9 cu ft per lb of aluminum for the continuous melting furnace, as against 3 cu ft per lb in a conventional reverberatory batch furnace. Deducting fuel requirements for the warmup period, the ratio falls to 1.1 cu ft of gas per lb melted.

Part of the economy and flexibility of the system lies in the small quantity of aluminum in process. Consider a 2000 lb per hr pouring rate. In the continuous furnace, only 1000 lb of aluminum is being processed at one time, with only a few hundred lb of it actually molten. To meet the same production with conventional reverberatory furnaces about 15,000 lb must be held in a liquid state at all times.

Operation of furnaces is simple. Once operating temperature is reached, charging rate is set to meet the demand. Fuel is adjusted to achieve desired pouring temperature as the oxide envelope is pierced.



Looking into discharge end of furnace. Liquid aluminum pours off to left as it melts. This occurs behind wall seen as dark band through open door

Four, five, or six ingots (depending on furnace size) are set on the charging table every five to ten minutes. Regular cycle from cold ingot to molten metal takes from 24 to 30 minutes. Pouring temperature is maintained automatically by controlling the burners through a thermocouple in ladle.

Castings are of the same analysis as the ingots they are poured from and are reproducibly uniform from casting to casting. Intermediate alloys can be obtained by mixing ingots of different composition.

Ingots weighing from 35 to 60 lb are used at Monarch. Furnaces have been operated at rated capacity and at as little as 60 per cent of capacity without any appreciable decrease in efficiency.

(Gradient-heating furnaces are product of Sels Corporation of America, Dept. CP, Erie Avenue and D Street, Philadelphia 34, Pa. . . . or for more information reader may simply check CP 4693 on form which is located opposite last page.)

# Powell Lubricated Plug Valves

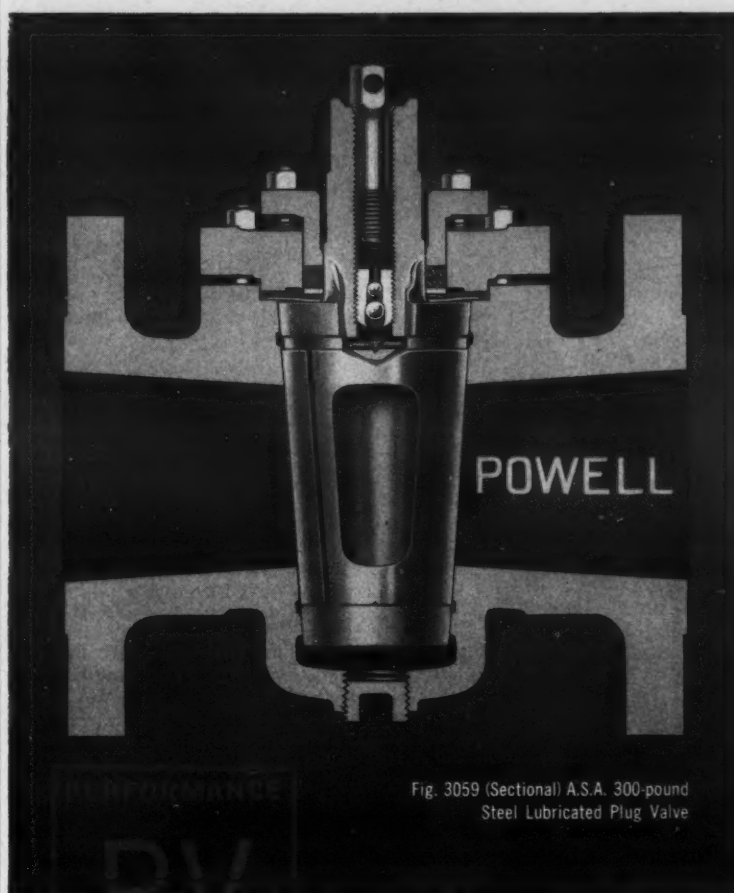


Fig. 3059 (Sectional) A.S.A. 300-pound Steel Lubricated Plug Valve



FIG. 1559G—150-pound Steel Lubricated Plug Valve. Gear operated



FIG. 2200—175-pound W.O.G. Semi-Steel Lubricated Plug Valve

VERIFIED

Powell Lubricated Plug Valves maintain the 110-year tradition of quality and precision. Only the finest available materials are used. And painstaking quality control is rigidly enforced through each and every step of manufacture.

*Valve users who want one source of supply for lubricated plug as well as all types of bronze, iron, steel and corrosion-resistant valves will want full details on Powell Lubricated Plug Valves.*

For example, features include quick and positive operation—just a quarter-turn to open or close. Lubricant grooves surrounding each port provide a positive seal when the valve is closed. In an open position, seating surfaces are not exposed. Available in Steel and Semi-Steel through distributors in principal cities.

For full details, write for the new PV-4 Catalog on Powell Lubricated Plug Valves. Just fill out the coupon and mail. Of course there's no charge, no obligation.

*The source of supply for all valve needs!*

## POWELL VALVES ...110th YEAR

BRONZE, IRON, STEEL AND CORROSION RESISTANT VALVES.

When inquiring check CP 4694 opposite last page

THE WM. POWELL COMPANY  
2525 Spring Grove Ave.  
Cincinnati 22, Ohio

Gentlemen:

Please send me a copy of your PV-4 Catalog on Powell Lubricated Plug Valves. It is understood that there is no cost, no obligation.

name \_\_\_\_\_

title \_\_\_\_\_

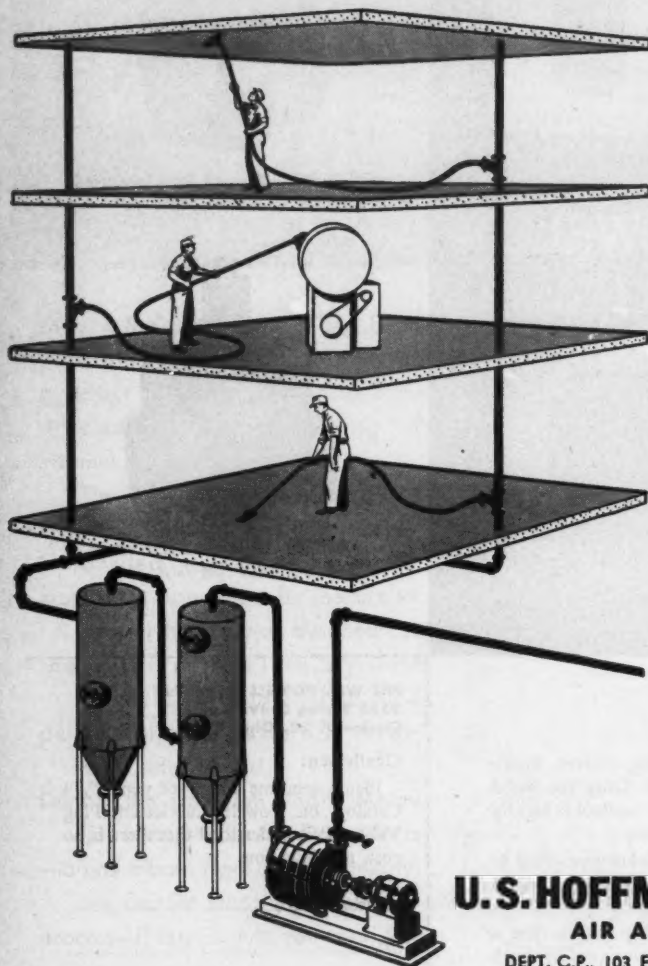
company \_\_\_\_\_

city \_\_\_\_\_

zone \_\_\_\_\_ state \_\_\_\_\_

# HOFFMAN'S ENGINEERED SYSTEMS *designed to do the tough jobs in industry*

**FOR REMOVAL AND RETENTION OF CHEMICAL DUSTS,  
YOU CAN'T EQUAL A HOFFMAN BUILT-IN VACUUM SYSTEM**



Combining the functions of a pneumatic conveyor system which unloads at a central point and a powerful, on-the-spot vacuum cleaner explains why the Hoffman Vacuum Installation is the "perfect performer" for clean-up and removal of dry chemicals and other materials.

Constant suction is piped to convenient outlets throughout the plant, and flexible hoses snap on to these outlets for quick thorough cleaning of walls, ceilings, equipment, and tables—as well as floors. A wide range of nozzle sizes and shapes makes it easy to dry scour any surface. And the powerful suction lifts and takes out just about anything that is dry and not nailed down.

All suction lines discharge into central collectors, where the transported matter is removed from the air stream and held for later salvage, disposal, or other treatment.

Heart of the Hoffman pneumatic systems is the famous, unique Hoffman Multi-Stage Blower and Exhauster—which serves equally well in supplying air pressure up to 9 lbs. psi, or vacuum to 12 inches Hg. These air movers are built to serve non-stop for long periods with minimum noise—no pulsation. They have no valves, vanes, pistons, gears, or other impacting and wearing parts to cause vibration and frequent maintenance.

When any form of pneumatic applications is a need, or problem, in your operation, call in the Hoffman engineers—first thing!

## U.S. HOFFMAN MACHINERY CORP.

AIR APPLIANCE DIVISION

DEPT. C.P., 103 FOURTH AVENUE, NEW YORK 3, N. Y.



### INDUSTRIAL FILTRATION DIVISION

Machine Tool Coolant Clarifiers—  
Flotation, Mechanical, and Magnetic.  
Lubricating and Insulating Oil  
Conditioners, Filters, and Vaporizers  
Solvent Recovery Systems—  
Vacuum Stills and Filters

### AIR APPLIANCE DIVISION

Multistage Centrifugal Blowers  
and Exhausters  
Pneumatic Conveying Equipment  
Industrial Vacuum Cleaning —  
Portable and Stationary Systems  
Continuous Metal Strip Driers  
"Smoothflow" Fittings and Tubing

### ORDNANCE EQUIPMENT DIVISION

Special Pneumatic Conveying Systems  
High Efficiency Centrifugal Separators  
Stationary and Portable Vacuum  
Cleaning Equipment  
Process Equipment  
Pneumatic Systems for Radioactive  
Materials

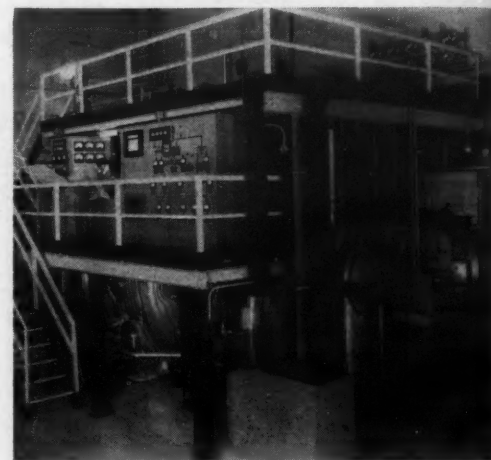
When inquiring check CP 4695 opposite last page

## IDEAS

### Giant 2200-pound furnace boosts industry's supply of vacuum-melted metal

Industry's potential supply of vacuum-melted metal has been increased by 60 to 75 tons per month with the recent start-up of a giant 2200-pound vacuum-melting furnace. Reported to be the nation's largest, the furnace is located at the Vacuum Metals Corporation plant, Syracuse, New York. Its design was based on five years of operating experience with semi-continuous vacuum furnaces.

Unit is remotely operated by the melter, who can control from one console the charging, mold transfer, and pouring operations. Melting unit is enclosed in a  $\frac{3}{4}$ "-thick, air-tight, liquid-cooled stainless steel chamber, with connecting air-lock chambers for



Vacuum furnace's design makes it possible to charge, melt, pour, and remove ingots without affecting vacuum in melting chamber

charging raw materials and discharging ingots. Design makes it possible to charge, melt, pour, and remove ingots without affecting the vacuum in the melting chamber. Mold-handling mechanism makes it possible to cast ingots of varying size and shape, either singly or in multiples, from a single heat.

Metals melted in a vacuum furnace are considered to be superior to conventional atmospheric-melted metals, particularly where such mechanical properties as stress-rupture strength, impact resistance, notch ductility, and fatigue strength are prime factors.

(Information courtesy of Vacuum Metals Corporation, jointly owned by Crucible Steel Company of America and National Research Corporation, Dept. CP, Henry W. Oliver Building, Pittsburgh 22, Pa.)

For more information on product at right, specify CP 4696 . . . see information request blank opposite last page.





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## Film censor at work

At 950-acre Kodak Park, the film-producing plant of Eastman Kodak Co. in Rochester, N. Y., they take no chances on film contamination.

For example, in the operation shown here, a red-wheeled Alloyco stainless steel valve rules out of the picture dangerous rust and iron contaminants which would spoil the thick fluid which is called "dope." These valves control the flow of dope onto

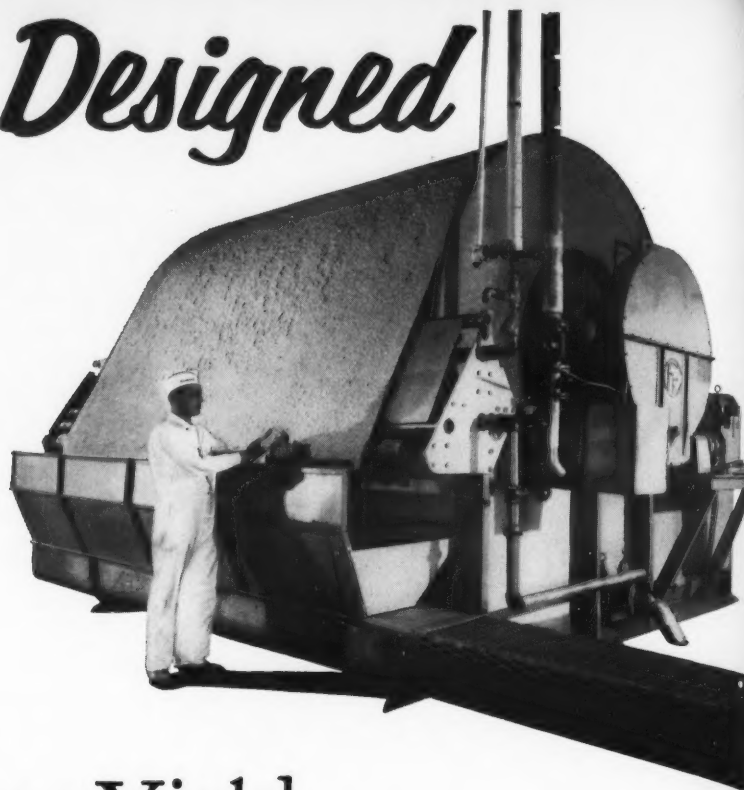
roll-coating wheels, where solvents are driven off with heat. The dry film base is then readied for the final coat of emulsion.

Today thousands of industrial processes are being safeguarded by Alloyco corrosion and contaminant resistant valves. Find out why their dependable performance makes them first choice for all types of vital flow lines. Write Alloy Steel Products Co., Inc., 1301 West Elizabeth Avenue, Linden, N. J.



Subsidiary of Walworth Company

# Custom Designed



## For a Bigger Yield

Higher yield in your case may mean cleaner, dryer cake . . . or better recovery of solubles . . . or just plain fast, trouble-free operation on a job that's got to be done. If you can get a few points better efficiency at no extra cost, why not?

FEinc custom-designed continuous vacuum filters have been doing just this for 37 years: For instance:

- Replaced six settling tanks in recovering plastic grinding waste . . . paid for itself in 3 months
- Reduced moisture in iron pigment from 68 to 59%

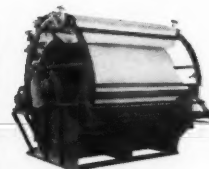
- Cut recycling of difficult gelatinous sulphate cake from nine to five cycles
- Eliminated plugging, gave three hours more running time daily on sticky clay
- Reduced solubles in metallic stearate from 0.5 to 0.05%
- Recovered  $\frac{3}{4}$  of chromates left by competitive filter

All types of continuous rotary vacuum filters . . . string, horizontal, scraper, precoat, etc. . . are custom designed and manufactured by FEinc . . . quality built because quality pays you. Ask for bulletins . . . or for recommendations . . . no obligation, of course.

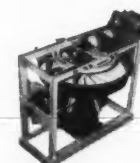
47

*For a  
Bigger Yield*

**FILTRATION ENGINEERS, INC.**  
155 Oraton Street, Newark 4, N. J.



STRING



HORIZONTAL



SCRAPER

. . . . .  
**CUSTOM DESIGNED CONTINUOUS FILTRATION**

When inquiring check CP 4697 opposite last page

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APRIL



# **Army package power reactor scheduled for completion by early 1957 . . .**

plant to have low operating costs; components can be shipped anywhere by air

A nuclear generating station now under construction is expected to operate in close competition with small conventional power plants. Known as the APPR (Army Package Powder Reactor), the plant will be the Army's first nuclear reactor. Design is such that its components can be transported by air — making the plant ideal for remote military bases. Initial operation is scheduled for early 1957.

The reactor will be operated at the 10-megawatt power level and will have a net electrical output of 1925 kilowatts. The steam generator, which requires a 33°F temperature differential to produce superheated steam, will be vertically mounted so that thermal convection will provide emergency cooling. An iron water shield will be provided if aggregate for a concrete shield is lacking at a remote site.

A steel shell, 36 ft in diam and 64 ft high, with 2 ft of concrete as a lining, will assure containment against nuclear accidents. When the reactor is refueled, spent elements can be removed under water to a deep water-filled storage pit outside the container.

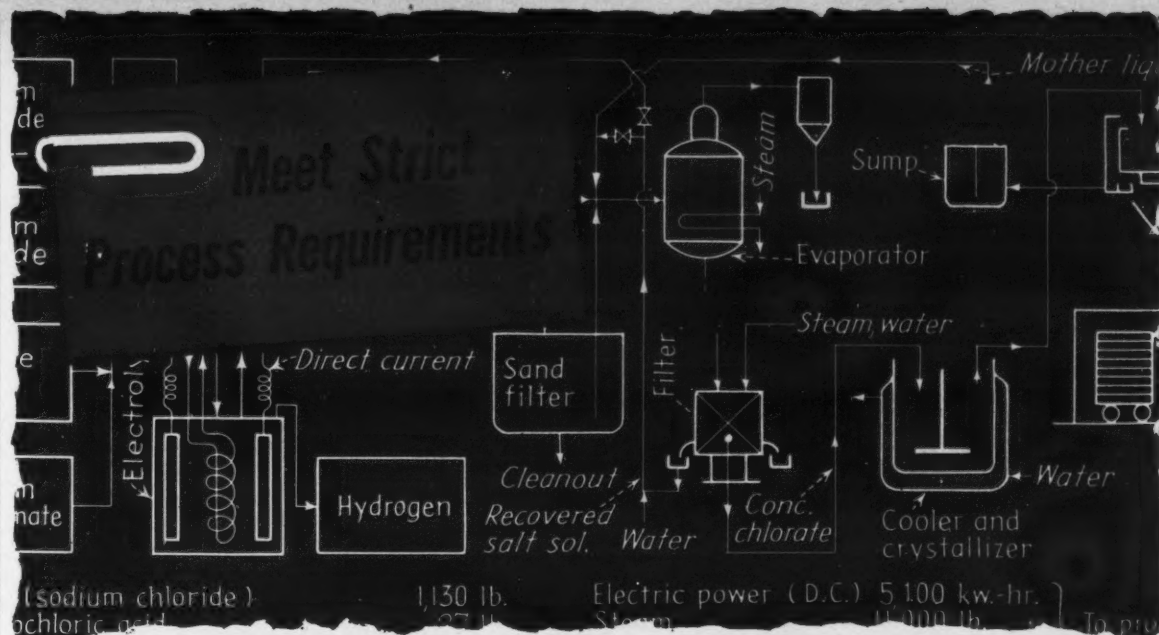
Figured on the leased-charge basis of \$25 per gram of contained U<sup>235</sup>, it is believed that the reactor can be operated at about 6 mils per kwh. Adding 2½ mils per kwh for fabrication of elements, and an estimated reprocessing cost of 1 mil per kwh, it is anticipated that total fuel cost for the APPR will not exceed 9½ mils per kwh. Setting labor costs at about 1.5 mils per kwh, total operating cost will amount to about 11 mils per kwh. This is estimated to be very nearly competitive with similar-size chemically fueled plants in high-cost-fuel areas.

(APPR reactor is being constructed by ALCO Products, Inc., Dept. CP, Schenectady 5, New York.)

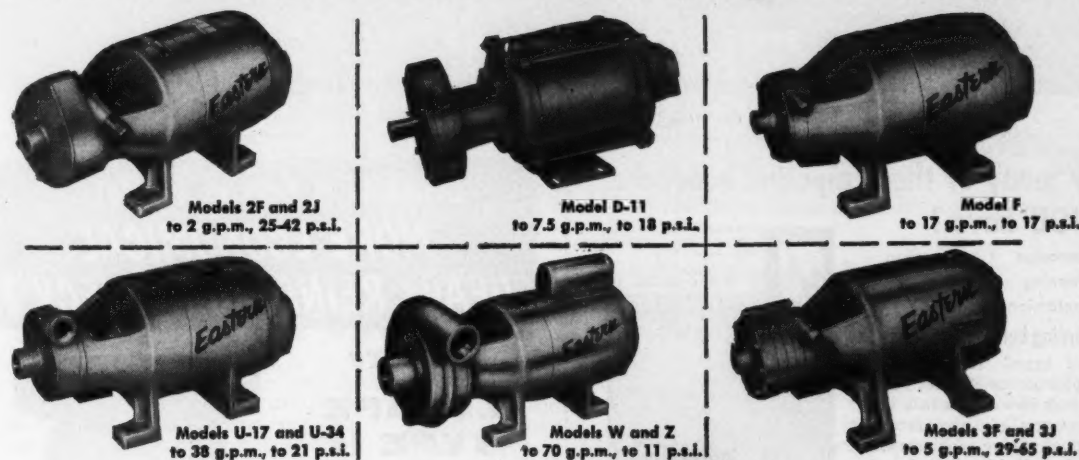
## **Economics of atomic energy**

Economics of feed materials and fuel processing problems for nuclear reactors are discussed in 24-page reprint. Topics briefly covered include general economics of atomic power, nuclear development, feed material and fuel preparation cycles, raw materials, fuel elements, operation of reactor, reprocessing, and waste disposal.

"The Economics of Feed Materials and Fuel Processing Problems" is issued by Vitro Corporation of America, Dept. CP, 261 Madison Avenue, New York 16, N. Y. When inquiring specify CP 4697A on the convenient Reader Service slip which is located opposite last page.



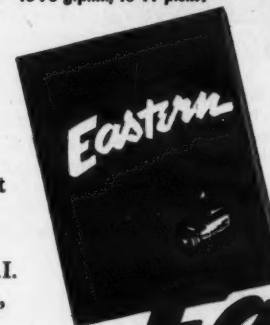
## **. . . with Eastern Centrifugal Pumps**



Recent redesign of these close-coupled Centrifugal Pumps has gained tremendous ruggedness and allowed for a wide selection of power requirements. In every detail of size, weight, space requirements, power, and costs, Eastern pumps fill the bill for strict process standards.

Six standard models range from 1/8th to 3/4 H.P., with capacities up to 70 G.P.M., pressures to 65 P.S.I. Eastern Centrifugal Pumps are available in Cast Iron, Bronze, Stainless Steel, Monel, and Hastelloy "C".

Eastern's engineering service offers many special models to meet your specific needs as to capacity and construction. Recommendations entail no obligation, and your inquiries are invited.



**NEW EASTERN CATALOG**  
Eastern Centrifugal Pump Catalog contains engineering data, performance charts, diagrams and helpful general information. Request Bulletin 110E.

**Eastern INDUSTRIES, INC.**  
100 SKIFF ST.  
HAMDEN 14, CONN.

When inquiring check CP 4698 opposite last page

# NORTHERN NITRALLOY PUMPS



Northern Nitralloy Steel Block Pumps are used in industries ranging from chemical laboratories to sandpaper manufacturing; and from oil refineries to corn syrup and candy industries. They are used to pump propane, ink, asphalt, peanut butter, molten lead, shellac and countless other products. Whatever your requirements, Northern Pump Company has the correct pump for any service.



There is a Northern Nitralloy Steel Block Rotary Pump made for every rotary pump requirement. Write today for detailed information including engineering data and description of complete Northern Pump line.

**NORTHERN ORDINANCE INC.**

Subsidiary

**NORTHERN PUMP CO.**

Minneapolis, Minnesota

When inquiring check CP 4699 opposite last page

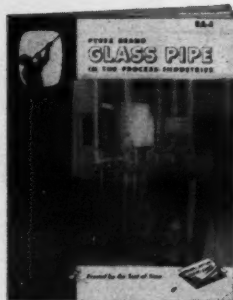
## How many of these pipeline headaches do YOU have?

- ☐ Corrosion ☐ Clogging
- ☐ Cleaning ☐ Cost
- ☐ Contamination

This Corning bulletin can help you

"PYREX brand 'Double-Tough' glass pipe in the Process Industries" tells how others in a variety of process industries are whipping tough piping problems with glass pipe. You'll recognize the names of most of the companies who are using PYREX pipe to handle such acids as sulphuric, hydrochloric, nitric, acetic, and such other fluids as chlorinated hydrocarbons, hydrogen peroxide, bromine, brines, low-concentration alkaline solutions, wine, milk, other beverages and foods.

The book covers a wide range of products, problems and processes. Among them you may well find problems similar to yours—solved with PYREX pipe. Bulletin EA-1 is free. Simply send the coupon or check this publication's reader service card for your copy.



*Corning means research in Glass*

### CORNING GLASS WORKS

34 CRYSTAL STREET, CORNING, N. Y.

Please send me Bulletin EA-1: "PYREX brand 'Double-Tough' glass pipe in the Process Industries."

Name \_\_\_\_\_ Title \_\_\_\_\_  
Company \_\_\_\_\_  
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When inquiring check CP 4700 opposite last page

## Looking for a Better... MORE ECONOMICAL HEAVY REINFORCING NECK?

### SPECIFY LENAPE TYPE H



- Superior, seamless construction assures maximum strength.
- Straight through pipe schedule bore eliminates turbulence shoulder of standard necks... greater resistance to corrosion.
- One piece, forged neck eliminates reinforcing pad and extra welding.
- Only one wrench required when O.D. is made to nut stop dimensions. Optional nut relief illustrated.
- Pound for pound—the Lenape Type "H" is actually less expensive than standard necks.

Full details are found on pages 7, and 16 to 19 of Lenape Catalog 10-53.



When inquiring check CP 4701 opposite last page

## IDEAS

### Multidimensional indexing speeds instrument-document search at NBS

Single set of index cards can accommodate collection of 18,000 references

An instrumentation-reference service has been established at the National Bureau of Standards for providing Government laboratories with more complete access to existing information on measuring instruments, controls, and data-handling devices. System is based on the concept of multi-dimensional indexing and was devised by the Bureau's Office of Basic Instrumentation. Search problem has always been difficult in the field of instrumentation because literature is not so well organized as in more compact fields.

Usually in punched-card systems a card represents a document, and the indices assigned to that document are noted by punching holes or notches at appropriate positions on the card. In the NBS system, a card represents an index term, and the iden-



Hand-operated indexing equipment consists of set of index cards (foreground), manually-operated punch (center), and plastic reading illuminator (background)

tity of the document to which that term applies is noted by punching a hole at the appropriate location on the card. Location of hole is determined by serial number assigned to the document.

System consists of a set of 5 x 8" index cards, a manually-operated punch, and a reading illuminator. A corner is clipped from each card to permit quick unambiguous orientation. Index term is carried in upper left-hand corner of card.

Cards are filed alphabetically within the following categories, or dimensions (approximate number of terms in each category is shown in parentheses):

- 1) Measurand (condition, physical property,



- quality, quantity, factor or effect to be measured or controlled) (255)
- 2) Principle of operation (289)
- 3) Object (material being observed) (76)
- 4) Name of instrument or component —
- 5) Field of application (52)
- 6) Stage in instrument development sequence (21)
- 7) Function in measurement or control (49)
- 8) Character of document (21)
- 9) Instrument performance characteristics and ranges (100)
- 10) Limitations on measurand (183)

Important advantage of the system is its flexibility. Card file can be expanded to include new terms as desired. Terms which are found to be ineffective can be eliminated at will. An additional category is under consideration to provide an author index coded in terms of the first few letters of the author's name.

#### Catalog of terms integral

Integral part of index is catalog of terms appropriate to each category. In operation, a classifier selects those descriptive terms which most aptly indicate the information contained in document to be indexed. No restrictions are placed on the total number of terms associated with a single reference.

Operator inserts separately into punching machine each of cards containing terms chosen to index a given document. Machine positions card and punches hole in it at position determined by serial number of document. Each associated card then has a hole in the same grid position. Cards are returned to file, machine set to next grid position, and system is ready for indexing another document. Since grid pattern provides a total of 18,000 punch positions, one set of index cards can accommodate a collection of 18,000 references.

#### Light identifies common references

To carry out a document search, investigator removes from file the cards containing the index terms associated with type of references he is seeking. Cards are placed on a plastic reading illuminator which properly aligns them. Any holes common to all the cards will then be seen as small spots of light. The positions of these visible bright spots identify references common to all the selected cards, which are therefore the references sought.

Application of the system at the NBS office has begun with partial coverage of current periodicals supplemented by coverage of abstract journals. Future plans call for an increase in the proportions of direct coverage of current literature.

(Information courtesy of National Bureau of Standards, US Department of Commerce, Washington 25, D. C.)



## These Crane valves stay tight on soap oils and fatty acids

**THE CASE HISTORY**—Leakage through valve seats in raw materials supply lines posed a serious problem for Davies-Young Soap Co., Dayton—makers of various type soaps and cleaning fluids. Unwanted materials leaking past metering stations would infiltrate processing vats.

Four different makes of valves were tried before these Crane valves were installed. With all four, results were the same—seat leakage developed quickly; the valves lasted no more than 4 to 8 weeks.

Valve replacement costs were a

factor on top of production losses.

The condition was remedied on installation of Crane No. 1670 Ni-Resist cast iron valves in January 1954. Eighteen months later—with no piping maintenance and no shut-downs whatsoever—the Crane valves are still holding tight. And they show no deteriorating effects from the fluids handled.

Crane Ni-Resist gates don't look much different from similar valves of other makes. Their difference is in properly designed, accurately finished seating of 18-8 SMO stainless

steel—plus the extra erosion-corrosion resistance of Ni-Resist bodies and bonnets cast by Crane. Thrifty buyers know these valves have no "equal" for handling many hard-to-hold, mildly corrosive fluids.

You should have the new folder (AD2047) on these valves. Ask your local Crane Representative for a copy, or write to address below.

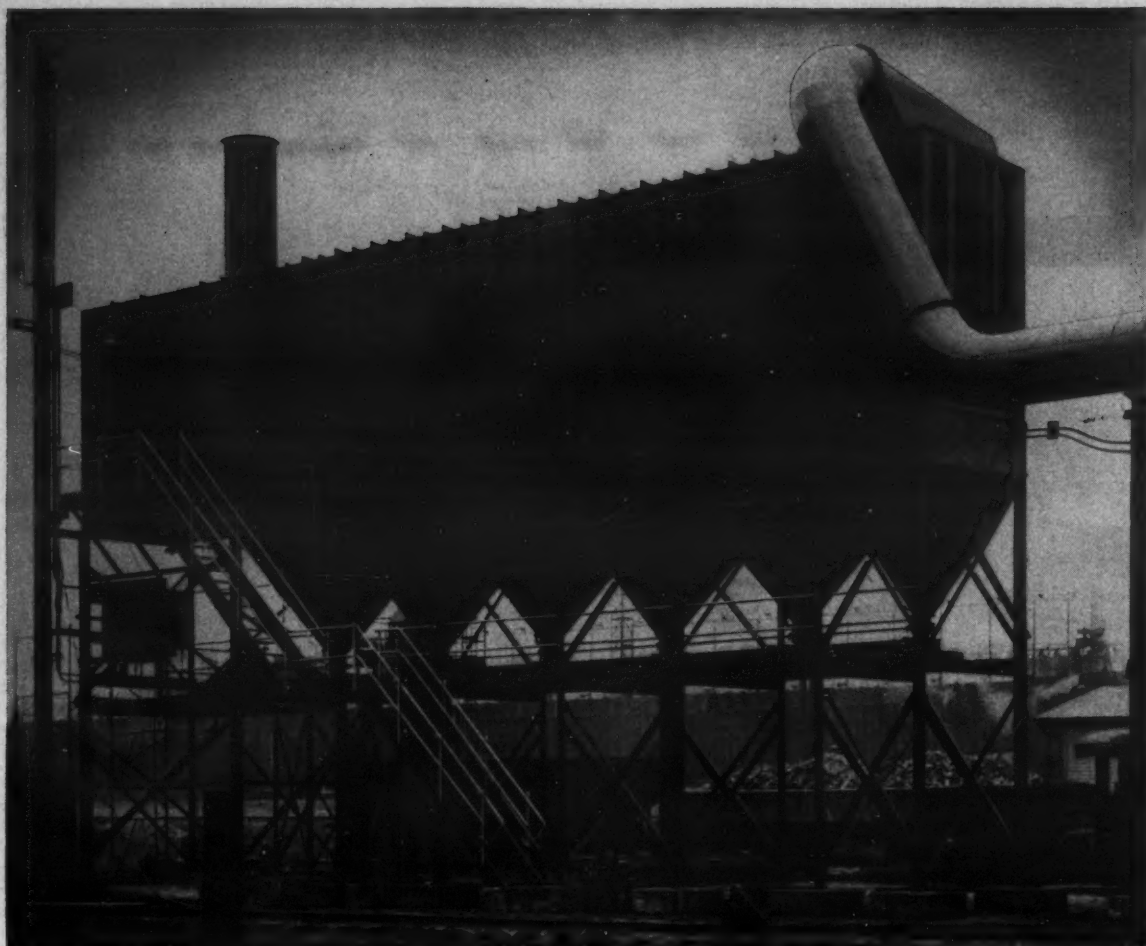


## CRANE VALVES & FITTINGS

PIPE • KITCHENS • PLUMBING • HEATING

Since 1855—Crane Co., General Offices: Chicago 5, Ill. Branches and Wholesalers Serving All Areas

When inquiring check CP 4702 opposite last page



This Dracco Multi-Bag Filter at Jones & Laughlin Steel Corporation's Aliquippa (Pa.) Works is a complete unit with integral classifier and fan house. As a giant "safety device", its job is to . . .

## "get the lead out!"

Jones & Laughlin Steel Corporation uses a Dracco Multi-Bag dust filter to keep its plant area free from toxic lead fumes which could endanger the health of workmen. These fumes are created at the pouring platform in the manufacture of leaded steel.

Lead, when added as pellets to molten steel, forms a suspension which acts as an internal lubricant to improve the machining quality of the steel. As

the pellets are added during the pouring process, some of the lead volatilizes.

To prevent escaping lead from polluting the plant atmosphere, dust intake hoods at the source trap 36,000 cubic feet of fume-laden air per minute. High efficiency of the Dracco Multi-Bag Filter assures 99½-100% fume recovery. Heavy-gauge steel construction of the filter unit makes it last longer with less upkeep.

Perhaps your plant has a dust problem causing product waste, abrasive wear to machinery or unhealthy working conditions. If so, it will pay to find out how Dracco methods can correct the situation and improve your plant efficiency. Write or call today!

**DRACCO CORPORATION**  
4070 East 116th Street • Cleveland 5, Ohio

**DRACCO** *Performance Proved*  
*Airstream* CONVEYORS • DUST CONTROL EQUIPMENT

**FREE! THE DRACCO ENGINEER.** Describes Dracco solutions to many bulk materials handling and dust control problems—includes tips on improving plant efficiency . . . published quarterly. Get on the mailing list. Write on your letterhead today!

When inquiring check CP 4703 opposite last page

## IDEAS

### Photosensitive aluminum plates suitable for manufacturing instrument panels

Development of heavy-gage, photosensitive, anodized aluminum plates makes it possible to produce instrument panels of high permanence in a photographic darkroom. Heretofore available in thickness limited to 0.020", the new panels are 0.064" thick. Panel faces are sufficiently rigid so that meters, rheostats, etc., can be mounted directly on them.

Since their original introduction, the plates have been used widely for producing wiring diagrams, dial faces, instruction panels, etc. on metal photographically. Because the legend is imbedded in the anodized layer of aluminum, great resistance to abrasion, acids, alkalis, and temperatures up to 1000°F are important features. Plates can be processed using conventional photographic solutions and techniques.

(Heavy-gage photosensitive aluminum plates are product of Metalphoto Corporation, Dept. CP, 6811 Superior Avenue, Cleveland 3, Ohio . . . or for more information about manufacturer's product, reader may simply check CP 4704 on form opposite last page.)

### Survey shows fish not affected by cooling water discharged from Hanford

Although radioactivity in measurable amounts was detected in Columbia River water 350 miles away from the Atomic Energy Commission's plant in Hanford, Washington, results of a two-year survey show that radiation levels were low at all points and there were no harmful effects on fish or other aquatic life in the lakes, rivers, or streams of the area. Plant uses river as source for cooling water, discharging it again into river after use in plant.

Highest level of radioactivity was found in the lowest form of aquatic life — the plankton. Average concentration of gross beta radiation in plankton was two-hundredths of a microcurie per gram. Next higher forms of life, the algae and Caddisfly larvae, were about one-third as active as plankton. Small fish had about one-fifteenth the plankton radioactivity. Adult fish were still less radioactive, even in those parts of the body having the highest concentration of radioactive materials. It was noted that the activity levels were about 10 times higher in scales, bone, and internal organs of the larger fish than in the edible parts.

Variations in the activity levels of the Columbia River water, which were about one three-thousandth of the average for plankton, depended upon changes in quantity and quality of cooling water discharged



to the river and upon seasonal fluctuation in volume of river flow. Activity levels in aquatic animals were dependent upon their metabolic rates and the activity of the material upon which they feed.

Maximum activity density values in aquatic animals occurred during low water stages and high water temperatures, usually in late summer and fall months. Migratory fish, such as salmon, had very low activity at the same time that levels in actively feeding species such as suckers, bass, and whitefish were high.

Insofar as could be determined, there were no measurable changes in the physical, chemical, or bacteriological characteristics of the river as a result of the discharge of reactor cooling waters over a period of several years. No deleterious effects on aquatic populations resulting from the levels of activity found during this survey could be detected. There was no evidence of build-up or carry-over of radioactive material from year to year.

(Based on paper presented at Cleveland Nuclear Engineering and Science Congress by R. C. Palange, G. C. Robeck, and C. Henderson, Robert A. Taft Sanitary Engineering Center, Dept. CP, Cincinnati, Ohio.)



"Phelps personally handles all our acid products."

Credit the above cartoon to S. L. Peeno, Designing Draftsman, Drug Products Engineering Section, Procter & Gamble Co., Cincinnati, Ohio.

The editors of CHEMICAL PROCESSING would like to see your cartoons. We will pay for those accepted. See page 23 for the rules.

For higher pressures  
— higher temperatures

## JENKINS CAST STEEL VALVES

serve the systems  
planned for lowest  
operating costs

The steadily increasing number of power generation and industrial processing installations of Jenkins Cast Steel Valves is clear evidence of economy-minded selection by valve specifiers and buyers.

Jenkins Cast Steel Valves offer any required combination of casting alloys and seating metals for any service up to 600 lbs. pressure and 1000°F. temperature. Along with specified ratings, buyers get the plus of Jenkins *extra value*, in design, in construction, in quality standards.

Test Jenkins Cast Steel Valves at the most punishing control points in your plant. Compare performance, and you'll see how they set new standards for long-range economy.

### PATTERNS

Gates 2" to 24". Globes and Angles 2" to 10". Swing Checks 2" to 12". Non-return, stop and check Globes and Angles 4" to 10".  
Screwed, Flanged, or Weld Ends.

### PRESSURES

150 lb. — 300 lb. — 400 lb. — 600 lb.

### PRESSURE CASTING ALLOYS

Carbon Steel (150 lb.)  
Carbon Molybdenum Steel — 300, 400, 600 lb. Valves  
Chromium Molybdenum Steel

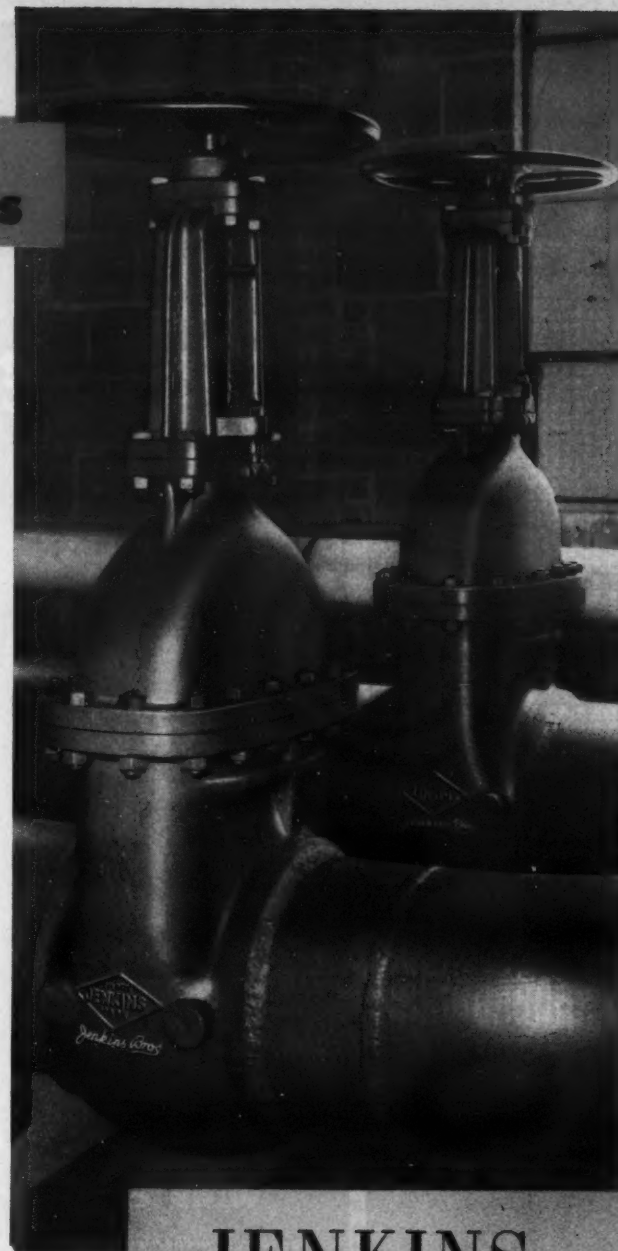
### SEATING METALS

H Monel  
13% Chromium Stainless Steel  
Carbon Molybdenum Steel, Stellite faced  
AISI Type 316 Stainless Steel

### FOR COMPLETE SPECIFICATIONS, GET THIS CAST STEEL VALVE CATALOG

It describes all patterns, casting alloys, and seating combinations, with details of the *extra value* design and construction features. Gives pressure-temperature ratings, dimensions, and other technical data. Get a copy from your Jenkins Valve Distributor, or write: Jenkins Bros., 100 Park Ave., New York 17.

SOLD THROUGH PLUMBING-HEATING AND INDUSTRIAL DISTRIBUTORS



JENKINS  
LOOK FOR THE JENKINS DIAMOND  
VALVES



When inquiring check CP 4705 opposite last page

for every  
**FILTERING,  
STRAINING,  
SIZING**  
job

## Ludlow-Saylor WIRE CLOTH

Specially developed alloys are stronger—longer wearing—resist corrosion and heat—cut replacement costs to a minimum. Accurate openings are maintained! Immediate shipment from stock of most sizes and weaves.

Write for Condensed Screen Reference Catalog

**LUDLOW-SAYLOR WIRE CLOTH COMPANY**  
614 South Newstead Avenue, St. Louis 10, Mo.

Sales Offices: Birmingham, 1727 Sixth Ave. North; Chicago, 5807 W. Diversey; Pittsburgh, Union Trust Building; Houston, 1213 Capitol Ave. • West Coast: Star Wire Screen & Iron Works, Inc., 2515 San Fernando Rd., Los Angeles • Subsidiary, Ludlow-Saylor Wire Cloth Co.

1856



1956

When inquiring check CP 4706 opposite last page

## IDEAS

### Company contends it's wiser to rent than to purchase processing equipment

Full-scale sales campaign has been inaugurated to place processing equipment on the property of financially responsible concerns on a lease basis, with an option to purchase at some predetermined date. Plan enables the machinery to earn its way and the rental payments are its rate of depreciation.

Contention is that if a concern's capital is worth more than six per cent a year, it is economically unsound for them to purchase equipment for cash, when a rental plan with option to purchase is available. As there is no chattel mortgage involved in such a transaction, the plan offers all the financial advantages of retention of capital and unimpaired credit; and further, the rent is paid with a tax-value-dollar.

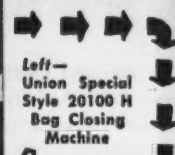
Equipment available under the plan includes colloid and roller mills, angular mixers, and various power equipment.

(Lease plan is offered by Troy Engine and Machine Company, Dept. CP, Troy, Pa. Check CP 4707 opposite last page.)

### Textile research, sales being consolidated by Celanese

One of the most complete development laboratories ever attached to a textile industry marketing operation is being established at Charlotte, N. C., by the textile division of Celanese Corporation of America. The move is being effected by a consolidation of sales personnel and technical service facilities drawn from Celanese operations elsewhere.

Under the new set-up, the selling organization will be reinforced by special technical services designed to help textile mills solve the complex problems of utilizing the many new fibers produced by the chemical fibers industry and to create profitable



Here's how to close  
**MULTIWALL  
PAPER  
BAGS**

**F**OR lower production costs...stronger, neater closures...ability to get out rush orders in a hurry, you can't beat Union Special Bag Closing Machines! Specially built to stand up under heavy production schedules, these machines provide the high output rates needed to meet modern competitive conditions.

In the Union Special line, it's easy to find the right unit to meet your particular requirements. **ASK FOR RECOMMENDATIONS.**



**SEND FOR THIS BULLETIN!**

Get your copy of this 16 page illustrated bulletin containing helpful data and charts on the complete Union Special line of bag closing machines. **UNION SPECIAL MACHINE CO.,** 44 North Franklin Street, Chicago 10, Illinois

## UNION SPECIAL

When inquiring check CP 4708 opposite last page

### DO YOU HAVE A SIFTING PROBLEM?

**HERE'S THE  
ANSWER!**

**UNIFLEX  
24" x 36"  
HIGH-SPEED  
PORTABLE  
VIBRATING  
SCREEN**



For fast, clean separations of coarse, medium or ultra-fine materials. Available in one or more decks, open or totally-enclosed models; fractional HP drive; may be aerially suspended, floor-mounted or operated from portable stand; fast simple changes in mesh panels.

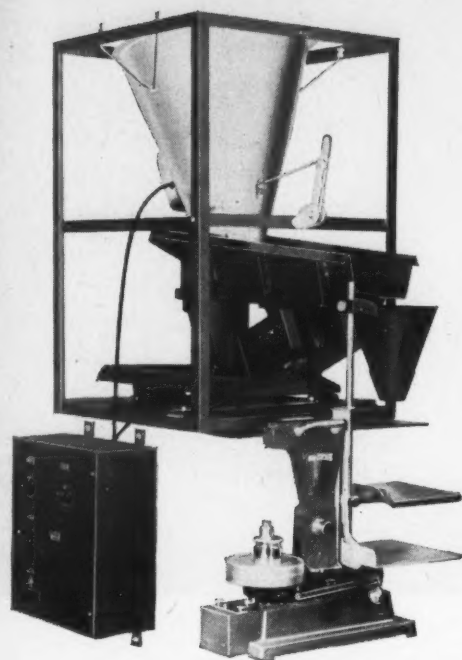
Write today for free catalog #150 on Screens & Screening!

**UNIVERSAL  
VIBRATING SCREEN CO.**  
Racine, Wisconsin  
Quality Screens Since 1919

When inquiring check CP 4709 opposite last page

CHEMICAL PROCESSING





## Precision Weigh Filling Machine for Packaging

This Exact Weight machine is ideal for filling any free flowing material into bags, boxes or cartons. Precision fill is assured by electronic controls connected with an Exact Weight precision industrial scale.

Model 1001-FM-2-30, illustrated, is extremely flexible and will economically handle any quantity from a few pounds up to 25 pounds. Vibratory feeder with adjustable fast to trickle feed insures greatest accuracy on every package. Visible indication permits accurate check by operator to maintain constant weight.

Other Exact Weight weighing machines are available with either automatic or semi-automatic controls. They are widely used in the chemical industry for packaging, bagging, batching, compounding and weigh feeding into processing machines. Capacities from a few grams up to 150 pounds.

*Write for complete information.  
Sales and service coast to coast.*

# Exact Weight Scales

Better quality control  
Better cost control

THE EXACT WEIGHT SCALE COMPANY

905 W. Fifth Avenue, Columbus 8, Ohio  
In Canada: P. O. Box 179, Station 5, Toronto 18, Ont.

When inquiring check CP 4711 opposite last page  
APRIL 1956

## IDEAS

new fabrics from them. The location will be the headquarters for the entire Celanese textile marketing organization.

Personnel involved in the marketing department consolidation are supervisory personnel and pilot plant technicians from the experimental weaving, dyeing, and finishing plant in Hopewell, Va. Other members of the team will come from research laboratories in Summit, N. J. While some development people will be shifted from the spun yarn mill in Burlington, N. C., commercial operations there will not be affected.

(Information courtesy of Celanese Corporation of America, Dept. CP, 180 Madison Avenue, New York 16, N. Y.)

### Technical writing made easy

How to write technical reports ("and still maintain your sanity") is explained in eight-page booklet. Originally prepared for engineers of a military defense



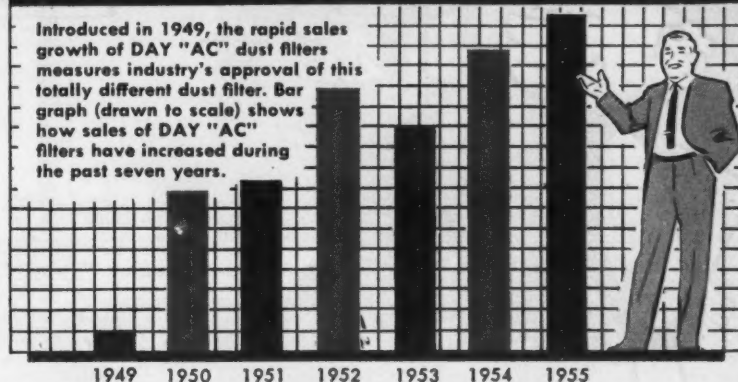
Emmett D. Dunderhead—engineer who heard he was going to be asked to do technical writing

laboratory, the easy-to-read book gives suggestions and lists steps to help make the writing job simple. Cartoons (sample here) add humor and help emphasize some of the points.

To obtain "How to Write Technical Reports" remit 25c direct to Technical Marketing Associates, Inc., Concord, Mass.

## DAY REVERSE JET DUST FILTERS HAVE EARNED INDUSTRY'S ACCEPTANCE

Introduced in 1949, the rapid sales growth of DAY "AC" dust filters measures industry's approval of this totally different dust filter. Bar graph (drawn to scale) shows how sales of DAY "AC" filters have increased during the past seven years.



## HERE'S WHY DAY Reverse Jet Dust Filters HAVE EARNED ACCEPTANCE!

Utilizing the Hersey principle of reverse air cleaning, DAY "AC" dust filters brought industry a needed, long overdue, improved dust filter. This filter has many benefits never before found in any dust filter equipment.

- **NEW HIGH EFFICIENCY PERFORMANCE**—This filter provides efficiencies measured as high as 99.99+%. This assures cleaner air and higher product recovery.
- **NEW FILTER MEDIA**—DAY felted filter media traps more dust than woven fabric. Felt gives higher efficiency, longer life and has same pressure drop as woven fabric.
- **NEW DESIGN FEATURES**—The Hersey principle of reverse jet cleaning, DAY self-adjusting blow rings, sanitary square-to-round air inlets, automatic-continuous operation, superior filter media, are just a few of the features introduced by DAY.
- **NEW FILTER TUBE CLEANING**—Patented self-adjusting blow rings clean the entire filter tube automatically and continuously, to give DAY filters an air handling capacity 5 times higher than ordinary filters.
- **NEW LOW INSTALLATION COSTS**—Unit sub-assembly saves time and money—up to 75% on filter erection costs.



Licensed by  
H. J. Hersey, Jr.



## The DAY Company

852 Third Avenue N. E., Minneapolis 13, Minnesota  
IN CANADA: P. O. Box 707, Fort William, Ontario  
Branch Plants: Buffalo, Fort Worth and Toronto, Ontario  
Representatives in Principal Cities

When inquiring check CP 4712 opposite last page



## O-RINGS are a valve's best friend

Let's face it . . . dripping, leaky valves are just not socially acceptable . . . so, we designed the new Hoke bar stock needle valve with an O-ring stem seal—to give it the right start in life. Result—a seal that will pass a helium leak test and no leaky, messy packing adjustments—ever. No friction either (even at high pressure)—you can operate the valve with a fingertip touch. There's a new, self-aligning spindle which shuts off tight time after time without galling or binding.

As you can see, the Hoke bar stock valve will contribute ease of operation, low maintenance cost and neat appearance to your equipment—hydraulic, pneumatic, instrument panel or test stand. It's available from stock in a wide range of sizes (1/8" to 1/2" pipe) and materials (carbon, chrome or stainless steel and brass) . . . panel mounting, too if you need it. We'd like to send you our Bulletin.

P.S. We've just published a new wall chart on Hoke valves with valuable information on valve sizing and corrosion resistance. May we send you one?

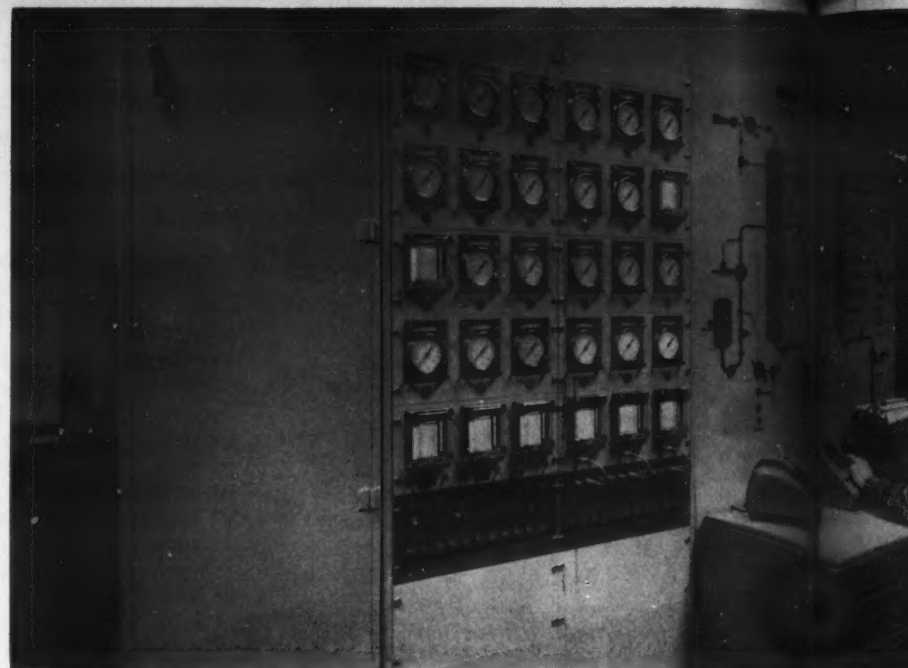


**HOKE  
INCORPORATED**

Fluid Control Specialists  
145 S. DEAN STREET, ENGLEWOOD, N. J.

## Instrumentation & control

Trouble at process points is signalled by audio and visual alarms. Operator can check any points desired without disturbing scanning pattern



Need for specific indication and control points will vary during process operation. "Start-up" may require one set of points. "Trouble-shooting" may require another group of readings. But this . . .

## scanning system adapts to process needs

and instrumentation can be simplified

**Uses:** As scanning and data logging process control system which ties in with a graphic panel, and can be used with existing instruments, either pneumatic or electric.

**Features:** Any scanning and logging sequence can be obtained by merely replugging control board. All process information is forwarded to control center for "on-normal" and "off-normal" interpretation. Recorders can be plugged in or interchanged during process operation to record trends for either controlled or non-controlled variables.

**Description:** Bringing all process variables directly in front of the operator, control system provides an "intelligence center" by using a graphic panel, a control panel, relay rack, automatic type-

writer, and auxiliary column printer. Graphic and control panels are tied in by numbered lights. Continuous scanning of each point is made at rate of one point per second. Signal lights glow to indicate point being scanned and condition existing (white for normal; red, above normal; and amber for below normal). Scheduled logging can be set for every hour, half-hour, or as often as desired.

"Off-normal" operation triggers both audio and visual alarms. Time, reading — of temperature, pressure, level, flow, pH, viscosity, speed — and station number which have been appearing upon the graphic panel in large digits continue to appear as scanned. But *trouble* process point is signalled by identification lights both on control and graphic panels. Audio alarm is silenced manually by

When inquiring check CP 4713 opposite last page

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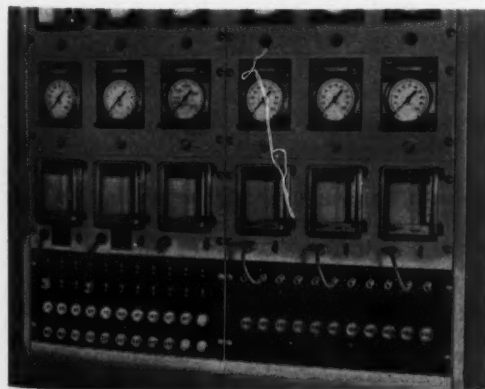




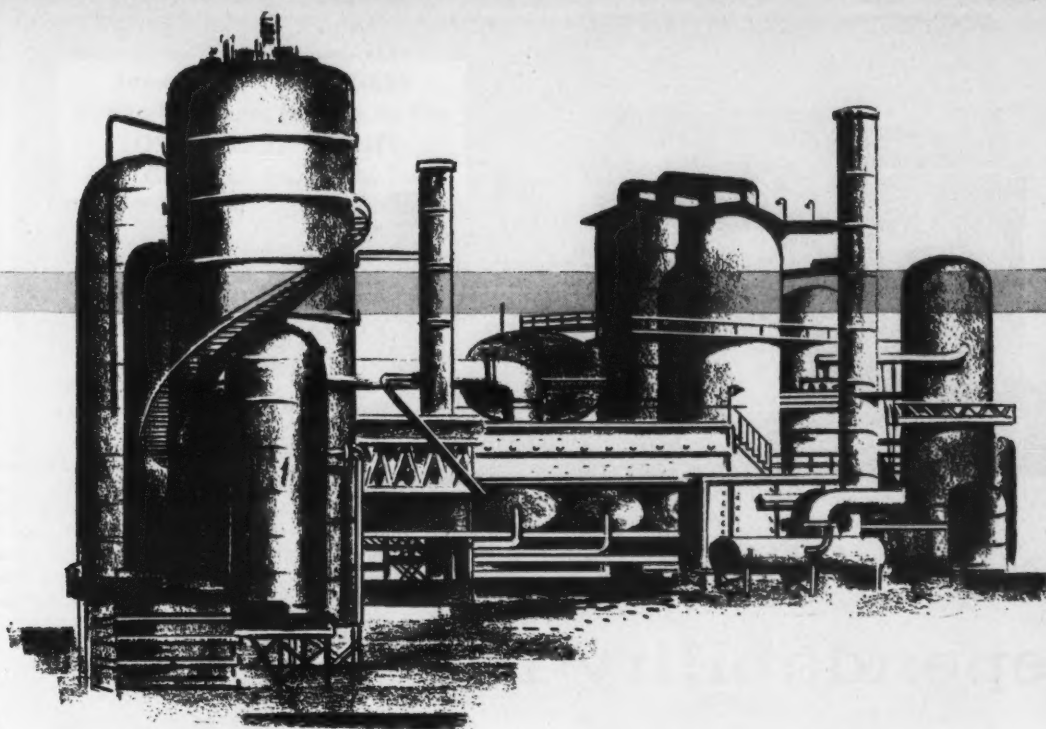
acknowledgement button at control desk. Off-normal station lights remain on until off-normal condition is corrected.

When off-normal condition is detected, operator, within seconds, can unplug an indicator and insert a recording instrument to analyze trends. Order in which processing points are scanned can be altered by re-plugging the relay racks. While all this is going on, point scanning is continuing at the one/sec rate. Automatic typewriter is logging time, point value, and station number of scanned points. Auxiliary column printer can be set to print return-to-normal conditions following process upset or it can continue to print off-normal values each time point is scanned.

"Trouble-shooting" may require another group of  
(Please turn to next page)



Recorders at bottom can be plugged in on any point.  
Indicators at top can be replaced by recorders

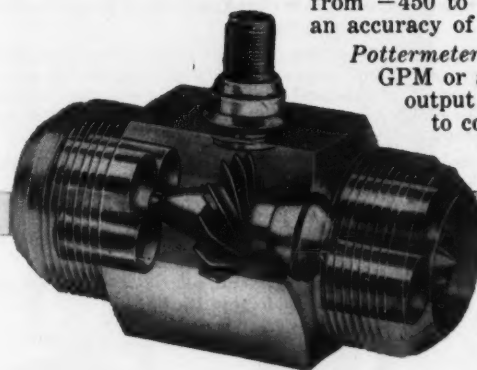


## FOR VITAL FLOW CONTROL

**W**HETHER you're developing a new process or modernizing an old one—investigate the unique characteristics of the bearingless *Pottermeter*.

This electronic flowmeter—easily installed in any type of piping to operate at any angle, at any pressure and at temperatures from  $-450$  to  $+1200^{\circ}\text{F}$ , measures flow of any liquid with an accuracy of  $\pm \frac{1}{2}$  of 1%.

*Pottermeters* are available to measure flows as low as 0.07 GPM or as high as 3,000 GPM. The inherently linear output of the *Pottermeter* makes it ideal for systems to control either flow rate or total flow.

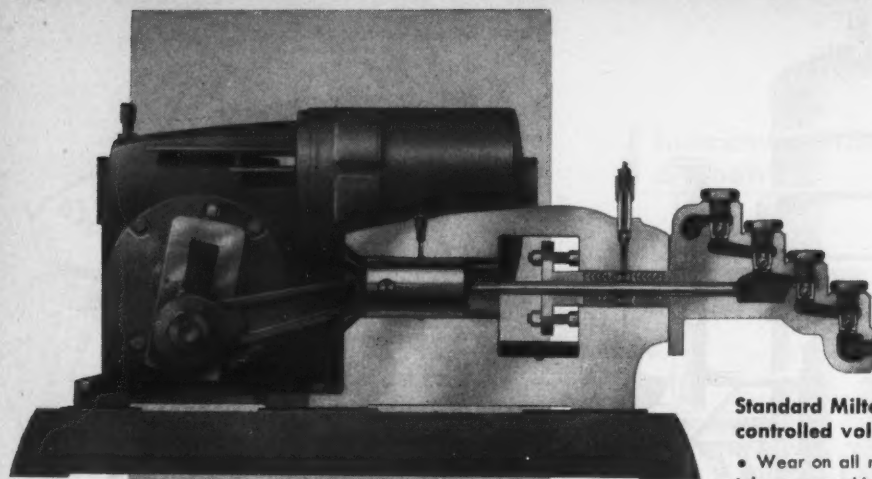


Find out how the bearingless "floating rotor" used in the *Pottermeter* can give you more precise flow measurement, longer trouble-free service life, and more accurate flow control.

Write for Bulletin PS-1

**Potter** **POTTER AERONAUTICAL COMPANY**  
Route 22 • Union, New Jersey • Phone MURdock 6-3010  
Makers of "Potter Engineered" products

When inquiring check CP 4714 opposite last page

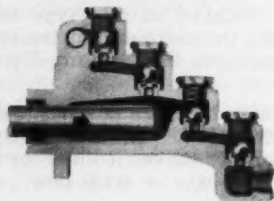


**Standard Milton Roy motor-driven controlled volume pump.**

- Wear on all moving parts minimized by close tolerance machining of cross-head, pump frames and liquid end parts.
- Excessive packing wear avoided by large length-to-diameter ratio of cross-head which fully supports plunger.
- Long service life under shock and oscillating loads assured by generously-sized reducer and connecting rod bearings.

## Dependability for metering process additives

**Exclusive Milton Roy STEP-VALVE LIQUID END**



Double ball checks, sloping passages and absence of air pockets assure highest possible volumetric efficiency. Should a solid particle lodge under one suction ball, for example, second suction ball will seat on discharge stroke, thereby preventing fluid from being pumped into suction piping.

**M**ILTON ROY dependability means long service life in your controlled volume pump . . . minimum maintenance . . . lower operating cost.

Here's why. Designed-in dependability is the result of extreme care in the sizing of motor horsepower, reducer torque and overhung load capacity. Reducer, motor and pump mounting pads on a rigid, webbed base are precision machined to assure perfect alignment of the entire assembly . . . and of all moving parts.

Specify Milton Roy . . . your guarantee of dependability in controlled volume pumps and complete chemical feed systems. A practical solution to your metering problem will be found in one of the following bulletins. Write for your copy today.

Bulletin 455 "Controlled Volume Pumps in Paper Making."

Bulletin 953 "Controlled Volume Pumps in Industrial Water Treating."

Bulletin 1253 "Controlled Volume Pumps in Process Instrumentation."

Milton Roy Company, *Manufacturing Engineers*, 1300 East Mermaid Lane, Philadelphia 18, Pa.



Engineering Representatives in the United States, Canada, Mexico, Europe, Asia, South America and Africa.

When inquiring check CP 4715 opposite last page

## INSTRUMENTATION & CONTROL

### Scanning System

(Continued from preceding page)



Recording instrument can be inserted, within seconds, to analyze trends

readings than scanning pattern will provide. Operator can readout any process point on demand by pressing station selector buttons. Complete logging of all points may be called for by the operator at any time.

Production data can be furnished to accounting or marketing departments as accumulated by auxiliary equipment using punch cards or tape.

System is designed to handle up to 100 process variables or points with basic equipment. Additional points can be added in increments of ten. Process changes can be easily reproduced on graphic panel as there are no instrument cut-outs.

(Trans-Scan-Log Control System is product of Taylor Instrument Companies, Dept. CP, 95 Ames St., Rochester 1, New York . . . or for more information check CP 4716 on form opposite last page.)

### Converts shaft rotation to binary digits . . .

360° rotation equivalent to 16-digit binary number (or 65,536)

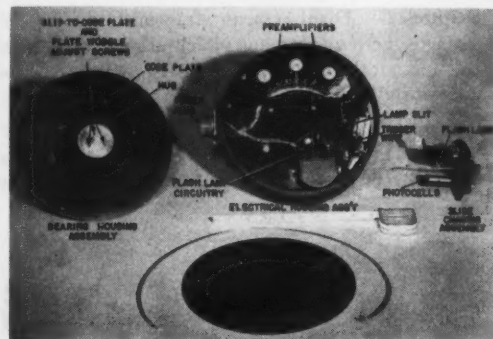
**Uses:** Will produce binary digital output signal corresponding to shaft rotation. Two models provide output to 13 binary digits or 16 binary digits. Sixteen binary digits correspond to 65,536.

**Features:** Each full rotation of disc corresponds to 65,536 discrete steps for 16-digit disc. Boundaries of these steps are marked accurately to within 8 parts per million. Markings on disc used to convert rotation to digits are accurate within 10 seconds of arc.

**Description:** Digital converters are designed around a disc with 13 or 16 "tracks." Each of these is divided into zones. Disc is made of glass on which binary code pattern is applied photographically. Diameter is 8½" and 16 tracks have diameters from 4.9 to 7.8 inches. Usable width of each track is 1/16".



To read shaft position, a five micron slit is positioned 0.003 inches above disc. Reading head contains removable flash lamp, mirror for directing light from the lamp through code disc and readout slit, and an array of phototransistors. These photocells — one for each track on disc — are fixed in removable block. Each photocell has positioning screw so that junction can be located precisely over readout slit.



Disassembled converter shows principal parts

Preamplifiers, power input plug, amplifier to photocell connecting plug, necessary circuitry for flash lamp, and signal output plug are all also contained in readout head. Electrostatic shield in this housing separates preamplifiers from flash lamp.



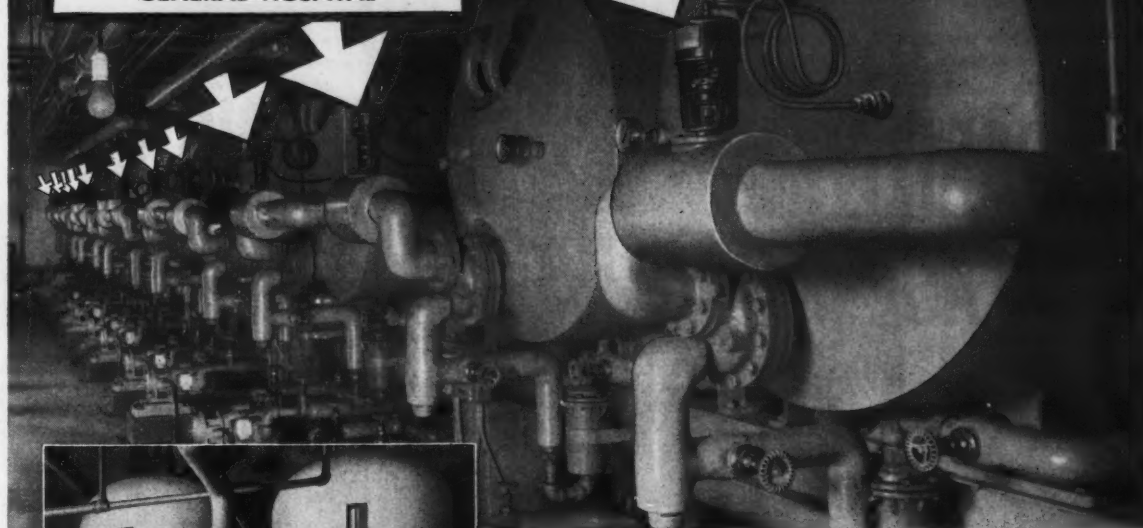
Assembled conversion unit is 9 inches in diameter

Output signals are approximately 5-7 volts at an impedance of less than 1000 ohms. This is suitable for operation into transistors or vacuum shift registers, magnetic multivibrators, or cyclic or ordinary binary translator. Shaft angles are sampled at rates up to 60 per second. Converter will operate properly over a temperature range from  $-55$  to  $+85^{\circ}\text{C}$ .

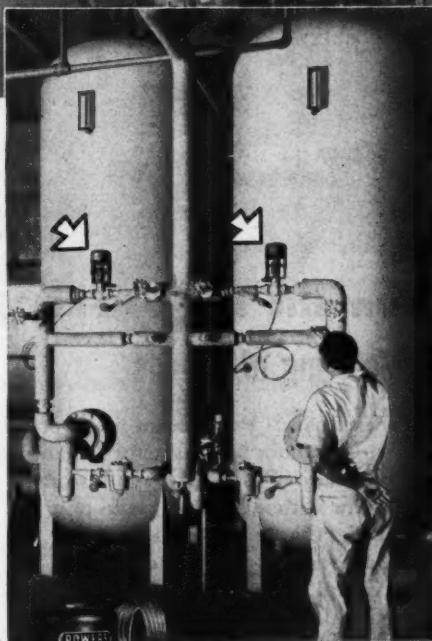
(Digital converter is a development of Encoder Div., The Baldwin Piano Co., Dept. CP, 1858 Gilbert Ave., Cincinnati 2, Ohio . . . or for more information check CP 4717 on form opposite last page.)

This month's Processing and Engineering  
Data Section starts on page 74

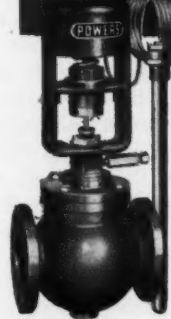
### Some of the 17 POWERS Controlled Water Heaters At The LOS ANGELES COUNTY GENERAL HOSPITAL



In 1933 Howe Bros., Contractors, installed 15 Powers Regulators here. All are still in operation, only 11 are shown in photo above.



Above: 1955 installation of Powers Controlled Water Heaters in Contagious Disease building.



POWERS No. 11 Self-Operating  
TEMPERATURE REGULATORS  
Give Better Control • Last Longer • Save More Money



(c48)

*"after 22 Years of good service*



No. 11 Self-Operating  
TEMPERATURE  
REGULATORS

*are still giving dependable control"*

Reports Mr. Louis J. Koch, Senior Master Mechanic

Performance records like this are not unusual with Powers regulators. With today's high cost of maintenance Powers time proven **QUALITY** controls are a more profitable investment than ever before.

**More POWERS to You** — when you want thermostatic control for water heaters, heat exchangers, heating and air conditioning systems or processes.

**Automatic control pays big dividends . . . IF** you have the right type of control and proper size valves for your requirements. Make sure, call POWERS nearest office for help with your problems.



**THE POWERS REGULATOR COMPANY**

SKOKIE, ILLINOIS | Offices in chief cities in U.S.A., Canada and Mexico

Over 60 years of Automatic Temperature and Humidity Control

When inquiring check CP 4718 opposite last page

**POSITIVE  
DISPLACEMENT**



**NO  
STUFFING BOX**

## **Specify Lapp Auto-pneumatic PULSAFEEDER ... for Automatically Controlled Metering of Liquids**

The outstanding features of the Lapp "Auto-Pneumatic" Pulsafeeder make possible continuous automatic processing of liquids which cannot be satisfactorily handled by plunger-type metering pumps. The "Auto-Pneumatic" Pulsafeeder is a piston-diaphragm pump providing positive displacement without the problems of a stuffing box. A hydraulically balanced Pulsafeeder diaphragm isolates the product from the working parts of the pump, preventing product leakage or contamination. With pneumatic instrument control, the pumping rate of the "Auto-Pneumatic" Pulsafeeder automatically adjusts from zero to full capacity. Manually adjustable models also available.

**WRITE FOR BULLETIN 440** with typical applications, flow charts, description and specifications of models of various capacities and constructions. Inquiry Data Sheet included from which we can make specific engineering recommendation for your processing requirement. Write Lapp Insulator Co., Inc., Process Equipment Division, 485 Wilson Street, Le Roy, New York.

**Lapp**

When inquiring check CP 4719 opposite last page

## **INSTRUMENTATION & CONTROL**

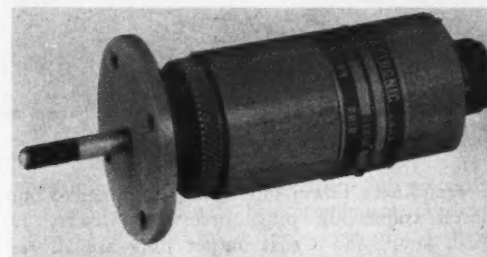
### **Displacement transmitter allows zero adjustment after installation . . .**

has mounting flange for convenient installation and operation

**Uses:** For transmitting rotational displacements electrically with extreme resolution, accuracy, stability.

**Features:** Displacement transmitter has micrometer zero adjustment which allows mechanical and electrical zero to be adjusted with precision after installation.

**Description:** Transmitter is a differential transformer which will furnish a means of measuring motions from 0.000001 to 0.125". Transmitter has



Displacement transmitter has linearity of 1/2%

mounting flange, standard "AN" connector, bearing aligned spring loaded plunger. Sensitivity is 5 mv/0.001" with 6.3v AC, 60 cps. Output impedance is 200 ohms. Linearity is 1/2%. Full scale output for .0000250" displacement can be obtained using indicating or recording instruments available from manufacturer.

(Model 100 Universal displacement transmitter is product of Daytronic Corp., Dept. CP, 216 S. Main St., Dayton 2, Ohio . . . or for more information check CP 4720 on form opp. last page.)

### **Shows remote monitoring of temperature**

Discussing an indicating and alarm system for critical temperature points, eight-page bulletin in two color pictures components of system. Method employs monitor units which can be located in control room or placed next to equipment being protected. Individual protection points can be bearings, process points in liquids or gases. Instrument system uses resistance bridge principle.

Pub No. 3036A Omniguard is issued by Instrument Division, Thomas A. Edison, Inc., Dept. CP, West Orange, N.J. When inquiring specify CP 4721 on form opposite last page.



## INSTRUMENTATION

### Cartridge heating units are precision fitted in stainless . . .

give surface temperatures up to 1250°F

**Uses:** Controlling ambient temperature of instruments, electronic equipment, indicating and control apparatus.

**Features:** Standard cartridge heating units are encased in precision fitted stainless steel sheaths with tolerances held to  $\pm 0.003$  in.

**Description:** Heating units are slim cartridges which give maximum surface temperatures of up to 1250°F. Internal arrangement of heating elements places elements close to outer surface of cartridge for maximum heat transfer and fast temperature rise. Standard units range from 40 to 1500 watts. Connections are made by screw terminals or by flexible glass insulated leads which are swaged to accessible rigid terminals.

(Cartridge heaters are product of Hotwatt, Inc., Dept. CP, 16 Gould St., Danvers, Mass. . . or for more information check CP 4722 opposite last page.)

### Catalogs tachometers for panel use

Bulletin of four pages describes manufacturer's line of stationary tachometers for panel or bracket mounting. Takeoff heads for medium, high, and low speeds are discussed. Speed controls and recorders are also described.

Bulletin 105 is issued by Metron Instrument Co., Dept. CP, 432 Lincoln St., Denver 3, Colorado. When inquiring specify CP 4723 on form opp. last page.

For more information on product at right, specify CP 4724 . . . see information request blank opposite last page.

● Manufacturing    ●● Manufacturing and product development    ●●● Manufacturing, product development and research    ●●●● Pilot manufacturing, product development and research

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	
Precision Mechanics, Optical Devices, Ceramics	●●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	
Electrical Equipment and Components	●●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	
Electronics	●●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	
Hydraulics, Liquids Processing, Heat Exchange	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	
Television: Studio, Theatre, Business, Institutional, Industrial	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	
Instruments, Servos, Controls: Hydraulic, Pneumatic, Magnetic, Electronic	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	
Aircraft and Missile Guidance, Control, Simulation	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	
Automatic Computers and Components	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	
Radar, Microwave, Ultrasonics	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	
Motion Picture and Audio Equipment	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	
Nuclear Power Components and Controls	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	

## SYSTEMS ENGINEERING



The GPE Companies are leaders in that small, select group in American industry which is broadly qualified to develop and produce the systems needed today for defense and industry. GPE leadership accounts for some of the most advanced systems in use in business, television, aviation, marine, steel, oil, and other industrial fields.

In Systems Engineering, highly advanced capacities and resources are prerequisite. Yet, no matter how highly advanced, they are of little use if limited to a few areas. Finding optimum solutions to complex systems problems calls for *balanced* competences. And beyond that, success calls for the consistent application of such competences at *every* stage — beginning with research, and extending all the way through development, production and final testing.

No GPE company is limited by the boundaries of its own specialties. The basic GPE operating policy, GPE Coordinated Precision Technology, places at the command of each company in the group all GPE research, development and production

facilities, and the skills and experience of the more than 2500 GPE technical men working in depth in the wide range of advanced capacities indicated in the chart above.

Behind each group working on a specific problem in one GPE company stands the whole group of GPE scientists, engineers and technicians with the answers — or the knowledge that will find the answers — to questions underlying and related to that problem. To the customers of GPE Companies this means that the concept and development of equipment, components and systems are not restricted or distorted by traditional allegiance to specific competences.

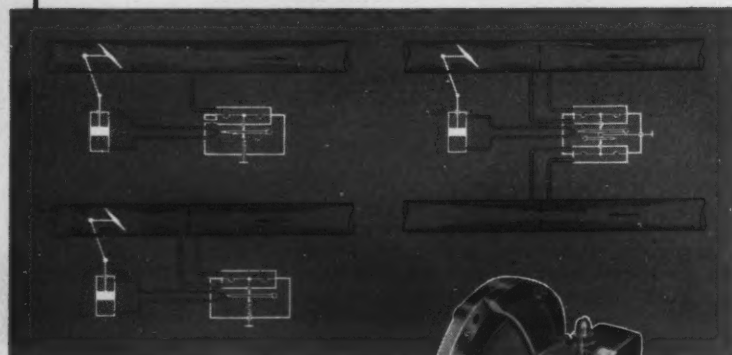
The five systems illustrated, while products of different GPE companies, are all examples of the consistent application of balanced competences, achieved through GPE coordination. For brochure describing GPE Coordinated Precision Technology and the work of the GPE Companies, or help on a specific problem, write: General Precision Equipment Corporation, 92 Gold Street, New York 38, N. Y.

## GENERAL PRECISION EQUIPMENT CORPORATION

### THE GPE PRODUCING COMPANIES

- ① KEARFOTT COMPANY, INC.    ② INTERNATIONAL PROJECTOR CORPORATION    ③ BLUDWORTH MARINE
- ④ GENERAL PRECISION LABORATORY INCORPORATED    ⑤ THE GRISCOM-RUSSELL COMPANY    ⑥ LINK AVIATION, INC.
- ⑦ SHAND AND JURS CO.    ⑧ THE HERTNER ELECTRIC COMPANY    ⑨ THE STRONG ELECTRIC CORPORATION
- ⑩ J. E. MCALEY MFG. CO.    ⑪ ASKANIA REGULATOR COMPANY    ⑫ AMPRO CORPORATION    ⑬ LIBRASCOPE, INCORPORATED

## THE "Jet-Pipe" AGE IS HERE... FOR PRESSURE, FLOW, COMBUSTION OR RATIO CONTROL



### and so is the **ASKANIA** Jet-Pipe Regulator

...the simplest accurate long-life solution to any regulator problem

• Check your most desirable specifications for the IDEAL regulator to control pressure—flow—combustion—proportion—other variables. Do they include

- 1 Rugged Construction 2 Dependability 3 Long Life 4 Accuracy 5 Speed
- 6 Inexpensive Maintenance 7 Unimpeded Operation in Freezing Weather
- 8 Freedom for use ANYWHERE?

All these features are common to all ASKANIA Jet-Pipe Regulators.

#### From Minute Signal to POWERFUL FORCE

The real magic behind the Jet-Pipe Regulator is the power which can be initiated by a minute signal—the degree to which the signal can be amplified—and the speed and accuracy with which it can be transmitted. The conversion of kinetic energy (velocity pressure) into potential energy (static pressure) is an important factor which multiplies the dependability you can expect in every ASKANIA control. The heart of ASKANIA Regulators—the Jet-Pipe—is practically frictionless. Bearings are continuously immersed in oil. Condensation and freezing are impossible. In every way, ASKANIA Regulators are designed and built for continuous, trouble free service over the years.

#### Applicable to these Controlled Variables:

**PRESSURE (Gage, Absolute & Differential) • DRAFT • COMBUSTION • FLOW LEVEL • DEPTH • RATIO • SPEED • DENSITY • CONSISTENCY • EDGE POSITION AND OTHERS**

What is your problem? For further information on the type of regulator control which best fits your operation, send today for Bulletin No. 139 and 155. Write the ASKANIA REGULATOR COMPANY, 242 East Ontario St., Chicago, Illinois.

## ASKANIA REGULATOR COMPANY

#### "CONTROLS FOR INDUSTRY"

HYDRAULIC, ELECTRONIC CONTROLS & SERVOS, GENERAL SYSTEMS, ENGINEERING & COMPUTER SERVICE, VALVE ACTUATORS & CYLINDERS

A Subsidiary of General Precision Equipment Corporation

When inquiring check CP 4725 opposite last page

## INSTRUMENTATION & CONTROL

**Maximum pressure gage gives visual proof of "peaks" . . .**

pressure applied is trapped inside bourdon tube until released by push button

**Uses:** Checking maximum pressure reached over a period of time without necessity of constant gage watching.

**Features:** Pointer can be returned to zero by pushing button on side of gage socket—releasing pressure.

**Description:** Check valve traps pressure applied to gage and indicating hand is stopped on dial at point of maximum pressure reached over any given period of time. Gage has dial range of 0-400 psi. Standard gage has polished brass case and ring, glass crystal, 2 1/2" dial, 1/8 male bottom connection, and means of recalibration.



Pressure is released by push-button

(Maximum pressure gage is product of Jas. P. Marsh Corporation, Dept. CP, 3501 West Howard St., Skokie, Illinois . . . or for more information check CP 4726 on the convenient Reader Service slip which is located opposite last page.)

**Input impedance of over 10<sup>12</sup> ohms feature of DC amplifier . . .**

contains own indicating meter or will drive recorders with 2 to 2000 millivolts

**Uses:** Maximum gain of 160,000 is attainable with DC amplifier. Frequency response extends from DC to 100 kc.

**Features:** Input impedance of this device is over 1,000,000 megohms.



Amplifier contains its own indicating meter

## "SERV-RITE" THERMOCOUPLE HEAD



### the head that's ahead in every way . . .

This new "Serv-Rite" thermocouple head is actually small enough to be held comfortably in the palm of your hand. But size is only one of the many features that make this thermocouple head really extraordinary. It is loaded with installation and service conveniences that any user of thermocouples will appreciate at once.

The body is of malleable iron, cadmium plated for durability. A new type friction lock assures easy removal or tightening of the cap—a quarter turn does it. An asbestos gasket makes the head dirt- and moisture-proof. With a choice of 1/2", 3/4", or 1" IPS opening for the protecting tube, you can standardize on one style head.

The connector block is of a material especially selected to withstand, without damage, temperatures up to 900° F. in continuous service. Improvements over the conventional type of inserts greatly simplify the making of the lead wire connections. The complete thermocouple element, including connector block, can be easily withdrawn for inspection.

Install a "Serv-Rite" thermocouple head and see for yourself how much better it really is.

Write for complete details

**GORDON SERVICE**

### CLAUDE S. GORDON CO.

Manufacturers • Engineers • Distributors  
Thermocouples & Accessories • Temperature Control  
Instruments • Industrial Furnaces & Ovens  
Metallurgical Testing Machines

603 West 30th Street, Chicago 16, Illinois  
2031 Hamilton Avenue, Cleveland 14, Ohio

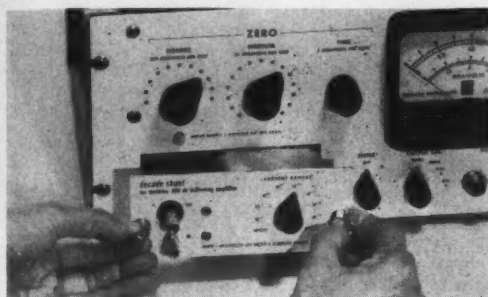
When inquiring check CP 4727 opposite last page

CHEMICAL PROCESSING



**Description:** Input terminals for amplifier are mounted on small plug-in panel. This can be interchanged with plug-in multipliers to extend voltage range to 800 volts full-scale. Normal high voltage full-scale range is 2000 millivolts, low range is 2 millivolts full-scale.

Power amplifier will drive direct-writing recorders.



Plug-in input panels extend voltage range or convert amplifier to a current instrument

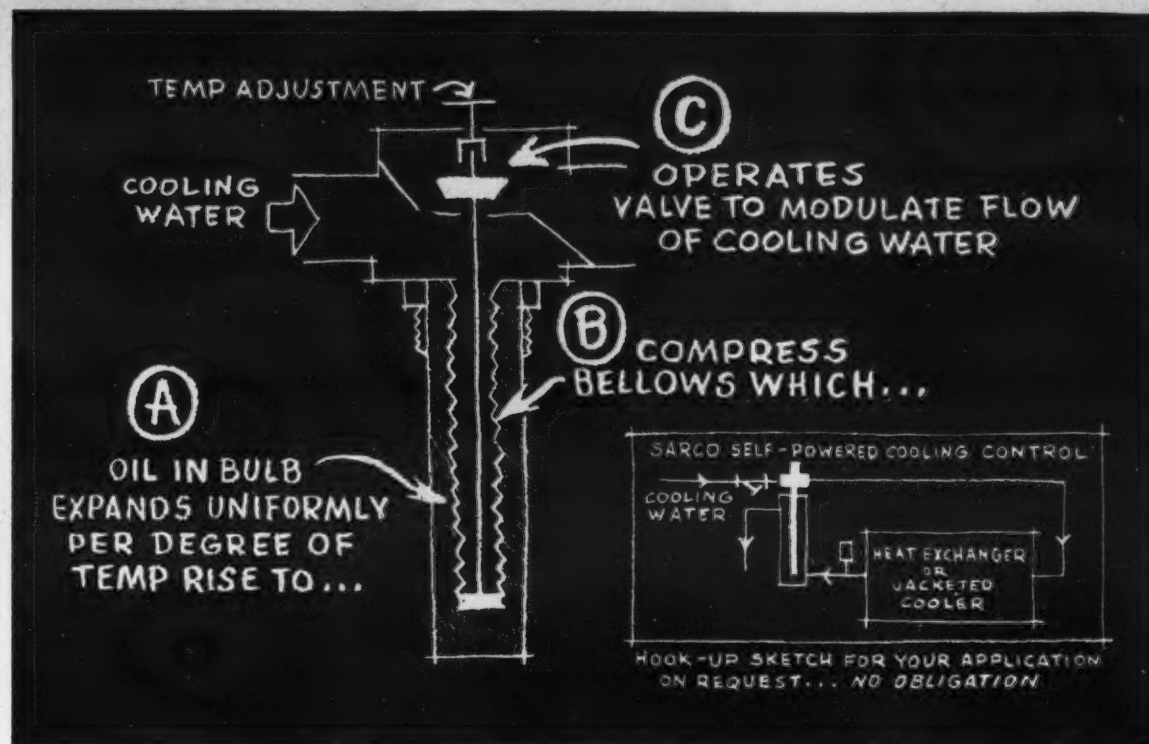
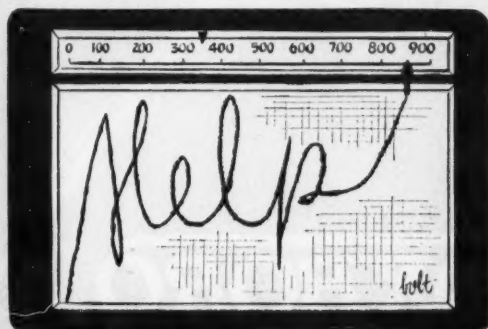
Amplifier can be used to measure voltages as low as 200 microvolts, currents to  $10^{-12}$  amperes, resistances as high as  $10^{14}$  ohms.

(Model 303 DC Indicating Amplifier and accessories are products of Keithley Instruments, Inc., Dept. CP, 3868 Carnegie Ave., Cleveland 15, Ohio. Check CP 4728 opposite last page.)

#### Features electro-hydraulic valve actuator

Catalog of two pages describes actuator design for valve position control. Actuator uses electro-hydraulic mechanism with time constants ranging from 0.002 to 0.016 seconds.

Cat 22 is issued by Weighing Components, Inc., Dept. CP, 64 Fulmor Ave., Hatboro, Pa. When inquiring specify CP 4729 on form opp. last page.



## Simple, inexpensive way to end waste and hazards of overcooling

**W**HEN cooling water is manually controlled ...the operator is forced to play it safe by leaving the water valve wide open to compensate for variables in the load and water pressure and temperature. Result—*overcooling*. If he tries to vary the flow of water ...he risks *undercooling*.

It pays to take responsibility off the operator's shoulders. Optimum *safe* temperature can be automatically assured by using Sarco Cooling Controls. They eliminate both overcooling and undercooling. They replace guesswork with certainty. Save man-hours and cooling water. Prevent damage to equipment.

#### Simple and Trouble-Free

Simple, trouble-free design—as you can see above, a temperature control need not be complicated! Self-powered...no electricity or compressed air required. Self-contained...no exposed mechanism. Packless...no packing to wear or leak.

Each year, thousands of these fully modulating and sensitive Sarco Controls provide dependable

service for firms such as Ingersoll-Rand, Butler Manufacturing Co., and Swift & Co.

#### Low Price

The low price makes it possible for you to use Sarco AUTOMATIC temperature controls for ALL control jobs, not just the big ones! For example, the 3/4" size costs only about \$39! Mail the coupon now.

## SARCO

Sarco Company, Inc., Empire State Bldg., New York 1, N. Y.  
Please send information on your simple, inexpensive  
Self-Powered Cooling Controls for use on \_\_\_\_\_

Name \_\_\_\_\_  
Firm \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

2199-B

When inquiring check CP 4730 opposite last page

## INSTRUMENTATION

### **Gives thermostat data on metals**

Listing properties of thermostat metals, pocket-size chart allows rapid means of comparison. Chart is printed on easy-to-read canary board for durability. Specifications are given on maximum sensitivity, useful deflection range, electrical resistance, flexivity.

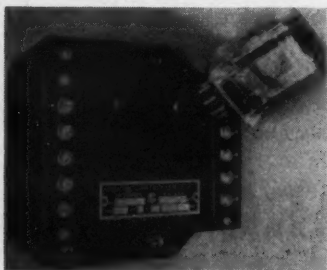
Thermostat Metals Equivalence Chart is issued by American Silver Co., Dept. CP, 36-07 Prince St., Flushing 54, N. Y. When inquiring specify CP 4731 on the convenient Reader Service slip which is located opposite last page.

### **Control coils are coated to reduce damage from water . . .**

floatless level controls have plug-in relays

**Uses:** Controlling liquid levels without moving parts.

**Features:** Operating coils are completely covered with moisture proof compound to eliminate possibility of damage from moisture.



Level control relay is enclosed in clear plastic

**Description:** Operating relay is plug-in model, DPDT, and is in a clear plastic case. Inspection of contact points can be made at all times. Relay is easily replaceable and permits quick change without long shut-down periods.

Controller uses double window



**FOXBORO**  
REG. U. S. PAT. OFF.



# Rugged, Versatile Temperature Transmitter Improves Remote Control

## the Foxboro M/12A (pneumatic)

There is no easier, simpler way to measure remote temperatures, *fast*, over so wide a range, with such high sustained accuracy, and at so low a cost!

Between the limits of  $-100^{\circ}\text{F.}$  and  $+1000^{\circ}\text{F.}$ , with operational spans of  $50^{\circ}$ ,  $100^{\circ}$ ,  $200^{\circ}$ , and  $400^{\circ}\text{F.}$ , this rugged, highly responsive instrument performs outstandingly under the most severe conditions. It is compensated for ambient temperatures and pressure. Derivative action can be furnished for optimum performance when

substantial thermal or transmission lags exist.

With its weatherproof housing and integral mounting bracket, it can be installed in any hazardous, corrosive, or outdoor location. Transmission lines are standard copper tubing, no electrical hazard, no costly capillary to run.

Write for Bulletin 13-17. It explains fully why the Foxboro M/12A Temperature Transmitter gives better performance with lower installation and maintenance cost. **The Foxboro Company, 814 Neponset Ave., Foxboro, Mass., U.S.A.**

FACTORIES IN THE UNITED STATES, CANADA AND ENGLAND

• Pneumatic Temperature Transmission

### INSTRUMENTATION

transformer. Liquid level probe controls operation of relay by controlling current passing through relay winding. Sensitive relay in turn operates to control liquid level.

(Level controls are product of Gulow Controller Company, Dept. CP, 301 Hackensack St., East Rutherford, N.J. . . . or for more information check CP 4732 on the convenient Reader Service slip which is located opposite last page.)

#### **Monitors gas streams during operation by Infrared . . .**

has photometric accuracy to within 1% transmission

**Uses:** Continuously monitoring and controlling liquid and gaseous process streams.

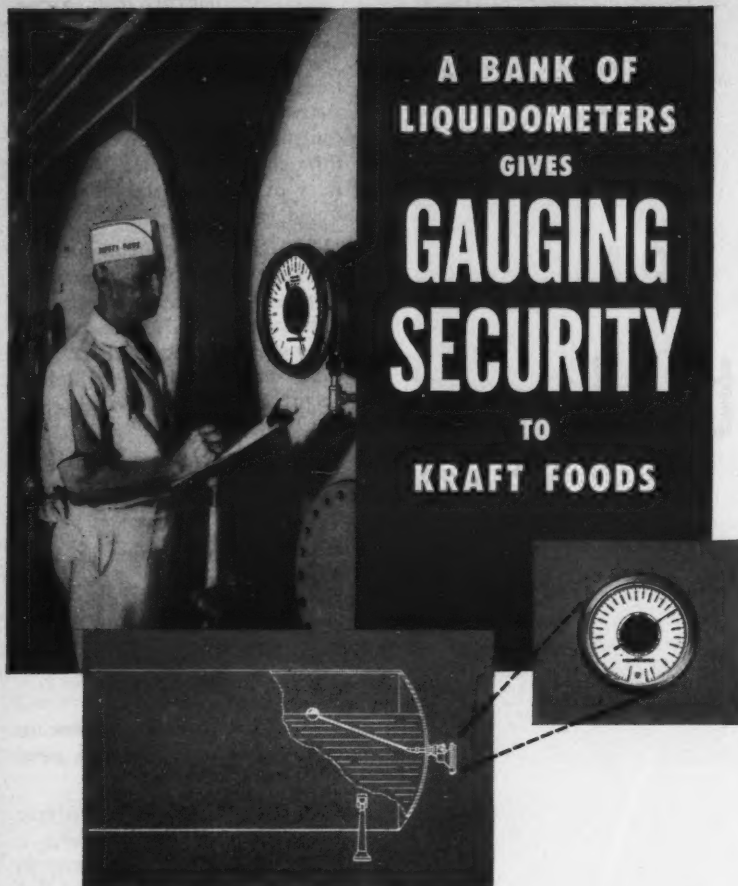
**Features:** Infrared analyzer has dispersive design, using a prism-slit optical arrangement. Unit can be used for mixtures that absorb at varying wavelengths.

**Description:** Infrared dispersive-type analyzer has three components — detector, amplifier, recorder. Detector is a single-beam spectrometer with slit width and wavelength adjustment controls, enclosed in an explosion-proof case. Amplifier can be separated from detector by distances up to 300 feet. Recorder can be either a modified stripchart or circular chart model. Unit has photometric accuracy to within 1% transmission while drift is less than 1% a day.

(Model 176 Dispersive infrared analyzer is product of Beckman Div., Beckman Instruments, Inc., Dept. CP, Fullerton, Calif. . . . or for more information check CP 4733 on form which is located opposite last page.)

◀ For more information on product at left, specify CP 4734 . . . see information request blank opposite last page.

**A BANK OF  
LIQUIDOMETERS  
GIVES  
GAUGING  
SECURITY  
TO  
KRAFT FOODS**



At the new Kraft Foods plant in Hillside, N. J., Liquidometer gauges supply an accurate, reliable measure of vegetable oils which are fed into the Kraft food processing system.

The gauges used by Kraft are 12" direct readers. Their function: gauging the contents of the 24 tanks in which Kraft stores vegetable oils at 100-120 degrees F. The slightest change in liquid level is instantly and automatically transmitted to a large, easy-to-read dial. Inventories are accurately maintained with a minimum of effort.

Liquidometer direct readers are available with automatic warning signals where certain liquid levels are critical. Dependability, low maintenance, high readability, safety and ease of installation ideally suit Liquidometers for every liquid gauging need.

A variety of dial type Liquidometer gauges are available for direct and remote indication. For complete details write Dept. H for Bulletin 463.



Liquids worth storing are worth measuring.

**THE LIQUIDOMETER CORP.**

SKILLMAN AVENUE AT 36TH STREET, LONG ISLAND CITY 1, N. Y.

When inquiring check CP 4735 opposite last page

## INSTRUMENTATION

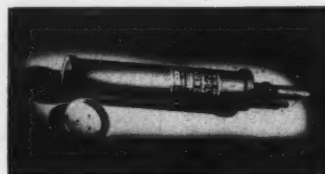
**Detects radioactivity  
for spectrographic  
X-ray use . . .**

operating temperature range  
is minus 55°C to 75°C

**Uses:** Detecting radioactivity involving elements as phosphorus, in X-ray spectrographic work in silicon and aluminum.

**Features:** Geiger counter tube has resolving time of approximately 150  $\mu$  sec.

**Description:** Threshold is about 800 volts. Slope of plateau is 10% max and end of plateau is



Tube for Geiger counter has resolving time of about 150  $\mu$  sec

over 1100 volts. Slope depends on counting rate and electronic measuring circuits. Figure of 10% is based on rate of 100 counts/sec at sensitivity of 1 volt.

Operating potential is 900 volts. Background with 2" of lead shielding is 75 counts/min max. Operating temperature is minus 55°C to 75°C. Tube is filled with neon gas and is halogen quenched. It is 6" long, 1" diam, weighs about 80 gm.

(No. 62030 Geiger counter tube is product of Research & Control Instrument Division, North American Philips Company, Inc., Dept. CP, 750 S. Fulton Ave., Mount Vernon, N.Y. . . or for more information check CP 4736 on convenient form which is located opposite last page.)

### Instruments needed?

Check the convenient product directory which starts on page 225 in this issue.

*Depend on*  
**AUTO-LITE**  
for  
**Temperature Indication**  
You Benefit from  Eye-Level Readings



Model F-1 temperature indicator

Auto-Lite offers many thermometer styles, permitting plant-wide temperature observation at low cost. Standard temperature ranges from minus 60°F to plus 750°F. Send for latest catalog showing various types.

THE ELECTRIC AUTO-LITE COMPANY  
INSTRUMENT AND GAUGE DIVISION  
TOLEDO 1, OHIO  
NEW YORK • CHICAGO • SARNIA, ONTARIO

**TEMPERATURE INDICATORS & RECORDERS**

When inquiring check CP 4737 opposite last page

**MERCOID<sup>®</sup>  
CONTROLS**

**NEW  
CATALOG  
NOW  
AVAILABLE**



WRITE FOR  
YOUR COPY

ASK FOR  
CATALOG No. 856P

**THE MERCOID CORPORATION**  
4201 BELMONT AVE., CHICAGO 41, ILL.

When inquiring check CP 4738 opposite last page

CHEMICAL PROCESSING



**Complete burner control  
for gas, oil, or both  
on one panel . . .**

control system is factory engineered and pre-assembled to reduce installation costs

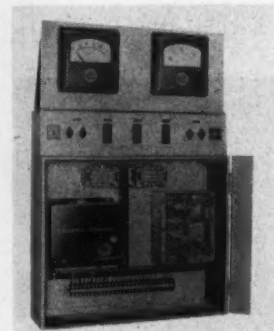
**Uses:** Fully automatic operation of oil, gas, and combination oil-gas burners.

**Features:** Panel control system has flame failure safeguard, programming control, short-circuit protection, motor starters, fuel selector switches, signals and alarms, combined in a single panel unit.

**Description:** Control system is pre-wired and fully tested before leaving factory. Panel system is factory engineered and integrated, and pre-assembled in accordance with standard wiring practices. On-the-job assembly of burner control components is eliminated. System employs flame sensitive cell to visually

monitor oil and gas flames. The system automatically safeguards each stage of burner operation; purging, proving pilot, limiting trial-for-ignition to a safe period, and shutting off fuel within 2 to 4 seconds if flame goes out without firing.

(Panel control system is product of Combustion Control



Combustion control uses flame-sensitive cell to monitor oil and gas flames

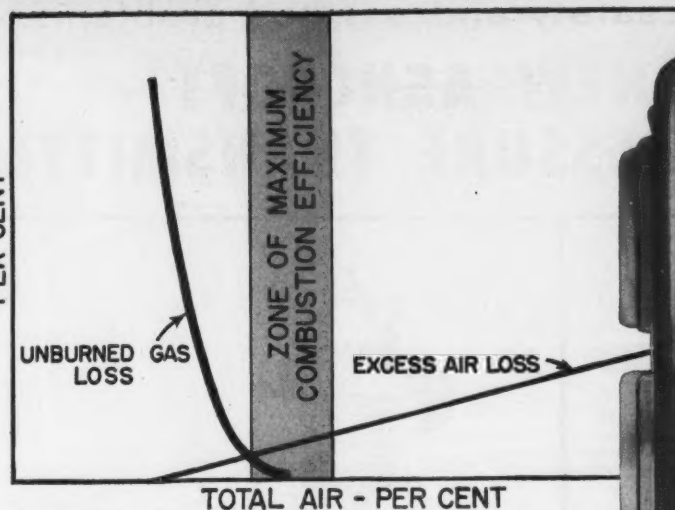
Div., Electronics Corp. of America, Dept. CP, 718 Beacon St., Boston, Mass. . . . or for more information about manufacturer's product, reader may simply check CP 4739 on form which is located opposite last page.)

**Discusses equations to speed  
computer programming**

Describing operational equations to short-cut electronic computer programming, 12-page booklet includes full description of method and gives examples. Method suggested saves time in programming analog computers by replacing complex computing circuits with symbolic equations. These equations specify every number, type, and interconnection of computing component required.

Data File 120 is issued by Berkeley Div., Beckman Instruments, Inc., Dept. CP, 2200 Wright Ave., Richmond 3, Calif. When inquiring specify CP 4740 on the convenient Reader Service slip which is located opposite last page.

HEAT LOST IN FLUE GASES  
PER CENT



The new Bailey Oxygen-Combustibles Analyzer-Recorder (shown at right) provides a continuous two-in-one check of combustion efficiency by recording both oxygen and combustibles in flue gas. As shown by above chart, both measurements are needed to determine combustion efficiency.



## BAILEY announces . . . New 2 in 1 way to measure Combustion Efficiency

The new Bailey Oxygen-Combustibles Analyzer-Recorder gives you a continuing double check on combustion economy. It's fast response measures and records:

1. **Excess air**—regardless of the fuel or combinations of fuels being burned.
2. **The mixing efficiency of your fuel-burning equipment**—by indicating the amount of combustibles in your flue gas, resulting from incomplete mixing of fuel and air.

Combustion efficiency depends upon fuel-air ratio. Too much fuel can be even more costly than too much air. And because of the interdependence of these two factors, no control that measures only one of them can give you complete protection.

Now, for the first time, you can check *both* with a single fast acting instrument, using the new Bailey Oxygen-Combustibles Analyzer-Recorder for industrial furnaces, kilns, heaters and boilers.

Fuel economy improves as excess air is reduced—until unburned fuel begins to show up in the flue gas. When this happens, combustion efficiency drops off

sharply if there are further decreases in the air-fuel ratio. That's why combustion gases must be analyzed for *both* oxygen and combustibles to get a true indication of efficiency—and that is why Bailey coordinates both measurements on the same chart, to show when excess air may be reduced safely without danger of greater losses from unburned gases.

The Bailey Oxygen-Combustibles Analyzer is an approved combustion safeguard.

Ask your local Bailey engineer for suggestions on application. Equipment details in Product Specifications E65-1 and E12-5. P31-1



# BAILEY METER COMPANY

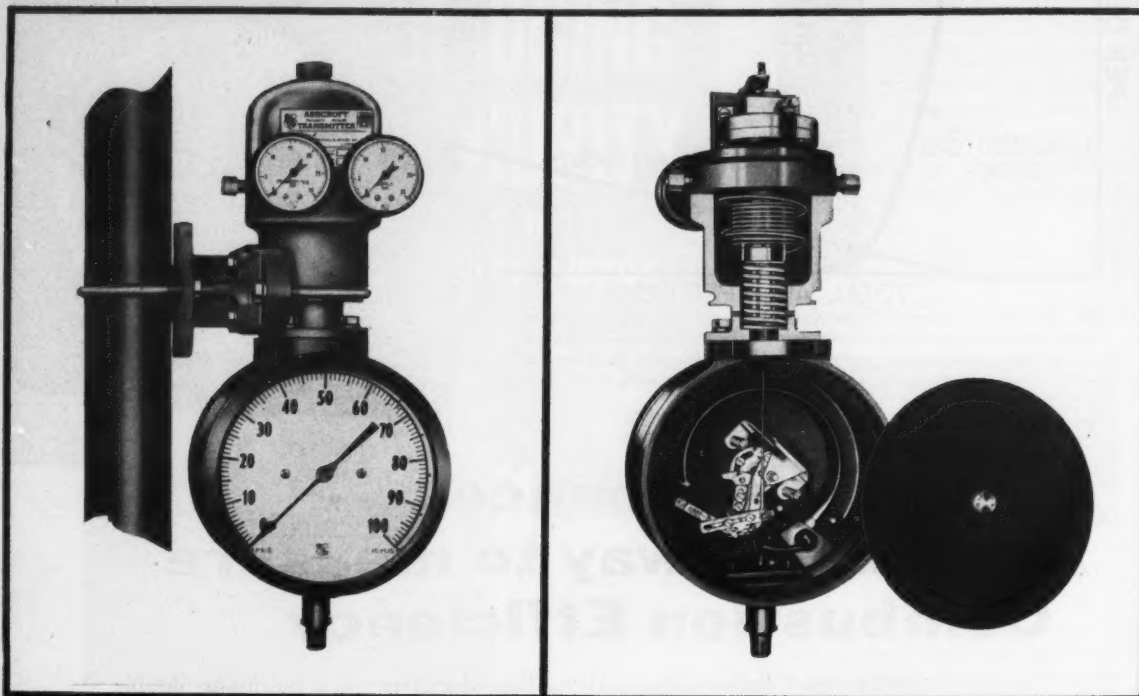
1074 IVANHOE ROAD • CLEVELAND 10, OHIO

INSTRUMENTS  
AND CONTROLS

When inquiring check CP 4741 opposite last page

Designed to solve safety and service problems

## ...THE NEW ASHCROFT PNEUMATIC PRESSURE TRANSMITTER



This new Ashcroft Pneumatic Pressure Transmitter is particularly recommended to processing industries and power stations. It combines speed and accuracy with maximum protection and serviceability.

The new design features the 6" indicating Ashcroft Maxi-safe Duragauge, long known for dependable performance. It has an integrally-cast solid metal wall between dial and pressure sensitive element so that the transmitter can measure pressures up to 100,000 psi with complete safety for personnel and equipment. If misapplication ruptures the Bourdon tube, the Teflon-coated back cover serves as a safety blowout relief.

Another outstanding design advantage is easy access to both gauge and transmitter sections. Simply remove the safety-relief back cover and both the gauge and transmit-

ter can be calibrated. Yet a sealed housing makes the entire assembly weatherproof.

The transmitter operates on low-pressure air. No need for expensive high-pressure lines and fittings. Supply air pressure as low as 18-20 psi for 3 to 15 psi output provides especially advantageous operation where electrical wiring might be a hazard. Inflammable, poisonous or corrosive liquids or gases are confined close to their source, away from the central control point.

The Series 1250 Ashcroft Pneumatic Pressure Transmitter is available with pressure sensing elements in all standard pressure ranges and Bourdon tube materials. Installation of the transmitter is easy. Small diameter tubing may be used, and the pipe, stem, wall or flush mounts are interchangeable in the field. Get complete operational data and construction details. Write for Bulletin 340.

**YOUR INDUSTRIAL SUPPLY DISTRIBUTOR** has the broad knowledge and thorough experience essential to satisfy every requirement of your Ashcroft Pneumatic Pressure Transmitter application. You get fast, economical service from his local stocks.

In Canada: Manning, Maxwell & Moore of Canada, Ltd., Galt, Ontario



### ASHCROFT GAUGES



A product of **MANNING, MAXWELL & MOORE, INC.** STRATFORD, CONNECTICUT  
MAKERS OF 'AMERICAN' INDUSTRIAL INSTRUMENTS, 'CONSOLIDATED' SAFETY AND RELIEF VALVES, 'AMERICAN-MICROSEN' INDUSTRIAL ELECTRONIC INSTRUMENTS, Stratford, Conn. 'HANCOCK' VALVES, Watertown, Mass. 'CONSOLIDATED' SAFETY RELIEF VALVES, Tulsa, Oklahoma. AIRCRAFT CONTROL PRODUCTS, Danbury & Stratford, Conn. and Inglewood, Calif. 'SHAW-BOX' AND 'LOAD LIFTER' CRANES, 'BUDGIT' AND 'LOAD LIFTER' HOISTS AND OTHER LIFTING SPECIALTIES, Muskegon, Mich.

When inquiring check CP 4742 opposite last page

## INSTRUMENTATION & CONTROL

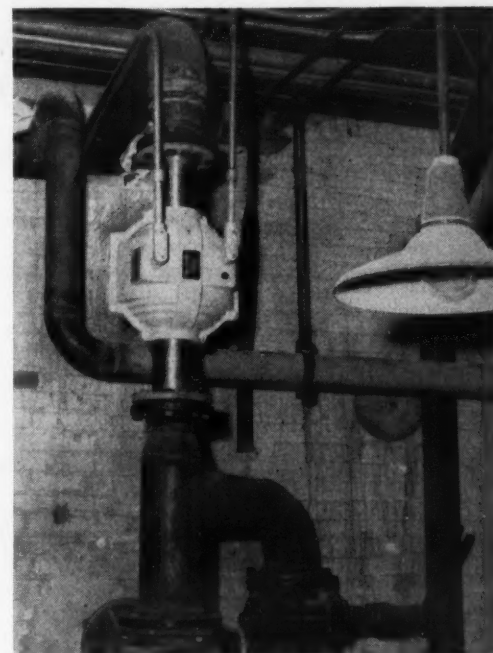
### Measures flow rate in remote spot

Meter uses magnetic field across pipeline, generates emf proportional to flow

Unless a uniform volume of stock is delivered at a uniform velocity along width of paper machine wire, manufacture of paper sheet will vary in weight, bulk, strength, appearance, smoothness.

Gaylord Container Corp., division of Crown Zellerbach, Bogalusa, Louisiana, installed a magnetic flowmeter to measure flow of four percent pulp stock. Eliminating restrictions in flow line, magnetic-principle meter required only that line be broken to install short length of four-inch stainless steel, non-magnetic pipe.

Having no moving parts, meter is essentially an electromagnet which induces a magnetic field through non-magnetic pipe. Two metallic electrodes are flush



Meters four percent pulp stock twelve feet above operating floor without restrictions in flow line

with inside surface of the pipeline and contact flowing liquid. Electrodes are mounted in a plane perpendicular to magnetic field and to axis of the pipe. Voltage generated across the two electrodes is directly proportional to rate of flow of flowing liquid.

With volumetric accuracy within 1% of full scale, flowmeter reading is independent of viscosity, density, consistency, turbulence, pressure. Flow can be recorded (either pulsating or average). Changes in



liquid conductivity do not affect accuracy of meter so long as minimum conductivity is maintained. Transmitter is equivalent to AC voltage generator and measuring instrument has high input impedance.

Since no adjustments have to be made at transmitter, Gaylord Container Corp. was able to install transmitting unit twelve feet above operating floor. Meter has been in operation since August, 1955. Installation was simple as only a short length of pipe had to be installed. Maintenance of transmitter has been negligible with no connecting lines to plug or freeze. There has been no more restriction to flow than corresponding length of standard pipe.

(Magnetic flowmeter is product of The Foxboro Co., Dept. CP, 174 Neponset, Foxboro, Mass. . . . or for more information check CP 4743 on form opposite last page.)

**Miniature toggle switch  
has positive action  
for "Off-On" . . .**

has minimum life expectancy of 100,000 cycles on contacts

**Uses:** For instrument and control installations requiring utilization of all available space.

**Features:** Small toggle switch has spring action which provides positive detent and snap action in both directions.

**Description:** Basic switch is riveted onto stainless steel bracket. Assembly shown in photograph

is for SPDT service. Miniature switches are also available for DPDT and TPDT. Switch unit is approximately  $\frac{3}{4}$  inches long and  $\frac{5}{16}$  inches thick. Unit mounts in a  $\frac{1}{4}$  inch hole. Electrical ratings are: 5 amp at 125/250 v AC; 3 amp at 30 v DC, inductive; 4 amp at 30 v DC, resistive; with a life expectancy of 100,000 cycles minimum. Push button models are also available for SPDT, DPDT.

(Model B-T-1-1)

Milli-Switch is product of Milli-Switch Corporation, Dept. CP, 1742 Berkeley St., Santa Monica, California . . . or for more information check CP 4744 on form opposite last page.)



Stainless steel bracket is riveted onto switch for easy mounting

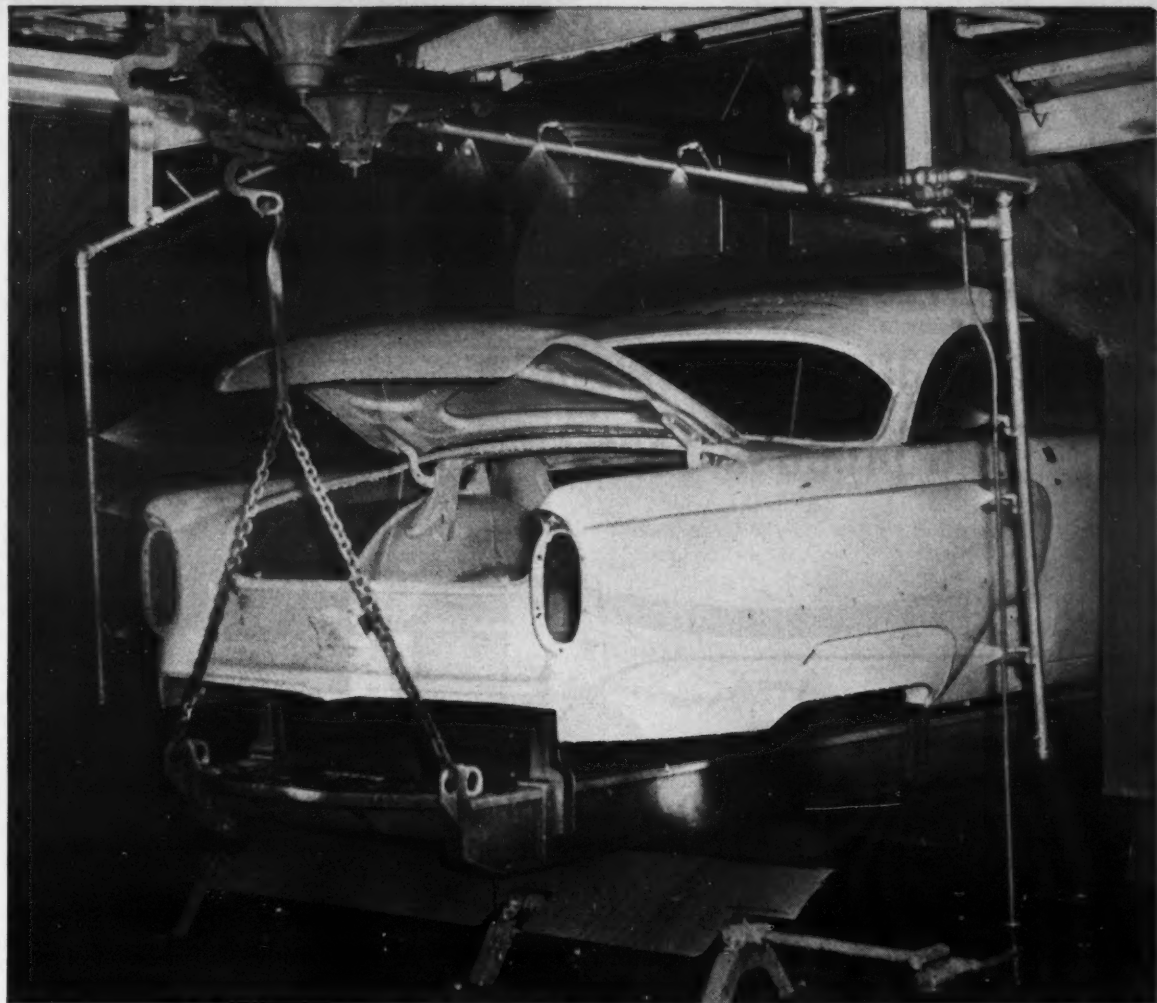


Photo courtesy Lincoln-Mercury Division, Los Angeles

## How quality control of water keeps Lincoln-Mercury enamel blister-free

Auto bodies get rinsed with water after phosphatizing and after the prime paint coat. If the water contains too much salt, it leaves deposits that can cause pinhead blisters in the finished paint job. So when paint chemists at Lincoln-Mercury's Los Angeles plant checked and found that the water-work's newest well was "salty," they took action.

They investigated drilling a new well and laying pipe to a better well. But these methods don't provide a permanent solution because the character of a well water often changes (with the level of the water table, etc.).

That's why Lincoln-Mercury decided to remove all mineral salts from their rinse water. To do this at low cost, they chose a Permutit Demineralizer (2 cation exchangers, 2 anion exchangers, 2 decarbonation tanks).

This Permutit Demineralizer keeps water quality uniformly high despite changes in the water supply. It actually delivers water as mineral-free as commercially distilled water. The results: beautiful finishes that stay blister-free.

Unvarying high-grade water may solve your quality-control problem. Let us help you get it at low cost. Write: The Permutit Company, Dept. CP-4, 330 West 42nd St., New York 36, N. Y.

# PERMUTIT®

rhymes with "compute it"

WATER CONDITIONING for BOILERS,  
PROCESSING, PUBLIC and HOME WATER SUPPLIES

When inquiring check CP 4745 opposite last page

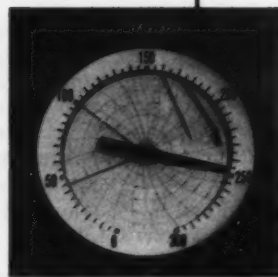
## Baldwin electronic SR-4® systems provide automatic tank weighing and process control



For accuracy and installation simplicity, Baldwin SR-4 tank weighing and process control systems have no equal.

Weight-sensing elements are fist-sized transducers which install easily below tanks or bins. These strain gage type transducers transmit signals to appropriate instrumentation. In a weighing system, tank weight changes appear on an indicator or controller. In a process control system, load cell output is fed to controllers and accessory equipment to provide closed loop control.

Baldwin SR-4 systems are instantaneously responsive and accurate to 1/4%. They can be custom-built from standard components for any application involving load, pressure, tension, torque or thrust. "Packaged" systems and component transducers are also available. For illustrated bulletins, write to Dept. 2406, BLH Corporation, 806 Massachusetts Avenue, Cambridge, Mass.



### ELECTRONICS & INSTRUMENTATION DIVISION

#### BALDWIN-LIMA-HAMILTON

DIVISIONS: Austin-Western • Eddystone • Lima • Hamilton •  
Loewy-Hydropress • Madsen • Electronics & Instrumentation •  
Pelton • Standard Steel Works

When inquiring check CP 4746 opposite last page

### INSTRUMENTATION & CONTROL

**Reads spot surface temperature  
from 50° to 1000° F  
in 60 sec . . .**

thermometer is made of stainless steel and calibrated to within  $\pm 2\%$

**Uses:** Reads surface temperatures of large steam heated pipes, furnace skins, hot plates. Also reads ambient temperatures in furnaces ovens, other enclosed places.

**Features:** Surface thermometer has range from 50° to 1000°F.

**Description:** Thermometer is made of stainless steel and is calibrated to within  $\pm 2\%$ . Calibration can be re-set by user, if necessary, at any time.



Reaches stability in one min

Thermometer is used by laying it on spot to be checked and allowing 60 sec for it to reach stability.

Instrument can also be used when completely immersed in non-corrosive liquids.

Overall diam is 1 3/4", weight 1/3 oz.

(Spot Check Surface Thermometer is product of Pacific Transducer Corp., Dept. CP, 11836 W. Pico Boulevard, Los Angeles 64, Calif. . . or for more information reader may simply check CP 4747 on the convenient Reader Service slip which is located opposite last page.)

**Dual purpose recorder  
automatically ratios  
two signals . . .**

outputs from electrical transducers for pressure, temperature, force can be handled

**Uses:** As dual purpose recorder which can be used as single pen strip chart recorder or as single pen continuous ratio recorder.

**Features:** As strip recorder unit has a full scale sensitivity as low as 5 mv.

**Description:** Recorder has two scales, one is used for normal recording and is graduated from 0 to 100 over 10 inches. Other scale, used for ratio recording, is graduated 0 to 100 over 11 inches.

When recorder selector switch is in normal record position, instrument is essentially a single pen strip chart recorder. When switch is in ratio record position, recorder will automatically ratio two DC

# Stop HAMMER

## in piping systems handling

- Water
- Oils
- Chemicals
- Acids
- Gasoline
- Brine

WILLIAMS-HAGER  
FLANGED

# Silent CHECK VALVES

Providing dependable protection against damage from "surge pressures," these *Silent* Check Valves may be installed in horizontal, vertical and angular positions.



Write for Bulletins:

No. 654 on the Valves

No. 851 on Cause, Effect  
and Control of Water  
Hammer

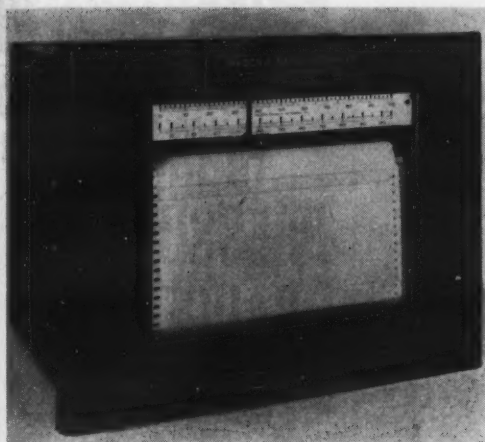
THE WILLIAMS GAUGE CO., INC.

146 Stanwix Street  
2 Gateway Center Pittsburgh 22, Pa.  
Our 70th Anniversary • 1886-1956

When inquiring check CP 4748  
opposite last page

CHEMICAL PROCESSING



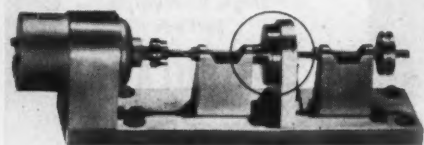


Two scales allow both normal recording and ratio recording

signals and record with a single pen. Reciprocal of ratio can be read by reversing recorder inputs.

Instrument will operate with high or low impedance input circuits. Outputs from any electrical signal source for pressure, temperature, force can be ratioed. Recorders are available with standard speed ranges, or in special "X-Y" models where "Y" axis records either another ratio or a function other than time.

(Ratio recorder is product of Phoenix Precision Instrument Company, Dept. CP, #803-05 N. Fifth St., Philadelphia 40, Pa. . . or for more information reader may simply check CP 4749 on form which is located opposite last page.)



Permanent magnetic clutch can work on batteries

Originally designed for operation of tape recorders, permanent magnetic clutch can be used in operation of battery-operated devices. Clutch requires no electric current for operation except an impulse for engaging or disengaging. Remote control operation is possible. (Circle indicates permanent magnets.)

(Magnetic clutch is product of Locke Machine Co., Dept. CP, 971 E. 63rd St., Cleveland 3, Ohio . . . or check CP 4750 on the convenient Reader Service slip which is located opposite last page.)

*Guaranteed*  
**TO  
SHUT  
TIGHT\***

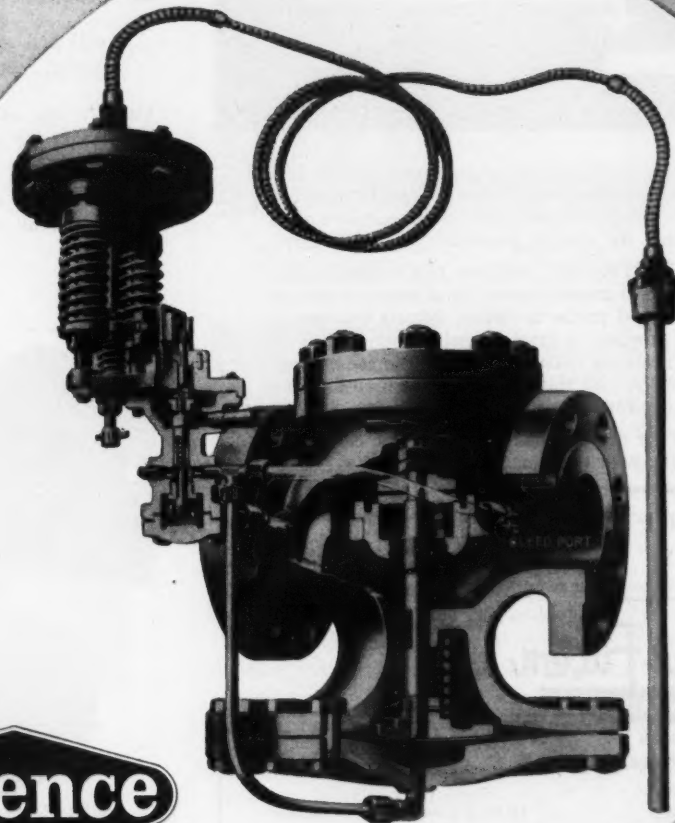
\*When equipped with a SECO Metal Seat and Disc on steam service and protected by an approved Strainer, a Spence Regulator is guaranteed to shut tight when the demand for steam ceases.

Expensive steam leaks due to a lack of absolutely tight shutoff are eliminated in Spence Temperature Regulators. Here is why we can make such a guarantee:

First, our temperature regulators are of the single seat design. Seats and discs are made of durable SECO Metal. More than 20 years experience in thousands of installations has failed to produce a single case where SECO Metal has been cut by steam.

These plus other design features explain why Spence Temperature Regulators function dependably and accurately year after year without requiring expensive repairs or special attention.

Want more facts? Write for Bulletin T50 giving full details.



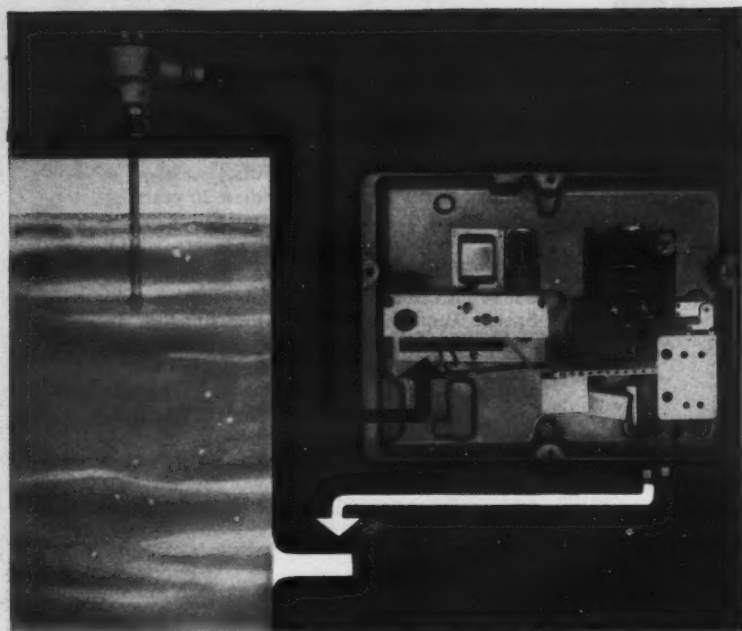
SPENCE  
TYPE ET150  
Temperature  
Regulator

**Spence**

**SPENCE ENGINEERING  
COMPANY, INC.  
WALDEN, NEW YORK**

When inquiring check CP 4751 opposite last page

## NEW PNEUTRONIC\* brings speed and simplicity to Pneumatic Control



The new Fielden PNEUTRONIC Control now provides proportioning pneumatic control without the disadvantages of mechanical systems. Pneutronic integrates electronic and pneumatic units in a null-balance system for simple dependable level control.

Electronically, the PNEUTRONIC features the versatile electrical capacitance method of measurement. As a result, it can be used with a simply-designed probe to detect minute changes in the level of any liquid, powder, or granular solid—conducting or non-conducting. The resulting change in capacitance changes output air pressure *directly*, and this output air then feeds back to balance the electronic circuit *directly*.

Send the coupon today for more ideas on how *Fielden Simplified Instrumentation* can solve your problems.

### PNEUTRONIC FEATURES

- Null-Balance System
- Only one radio tube
- Control pressure 3 to 15 psi
- No moving parts in vessel
- Controls water level up to 1½" span, hydrocarbons up to 8"

\*trademark



FIELDEN INSTRUMENT DIVISION  
(Dept. G) 2920 N. 4th St., Philadelphia 33, Pa.

Please send me technical bulletins:

- ☐ PNEUTRONIC Level Control      ☐ TELSTOR Continuous Level Indicator  
☐ TEKTOR Capacitance Level Control      ☐ TEKTOLOG Recorder-Controller  
☐ Fielden RF Capacitance Null-Balance Recorder

NAME \_\_\_\_\_ TITLE \_\_\_\_\_  
 COMPANY \_\_\_\_\_ ADDRESS \_\_\_\_\_  
 CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

When inquiring check CP 4752 opposite last page

## INSTRUMENTATION & CONTROL

### Discusses volumetric feeder for chlorine gas

Describing a volumetric chlorine gas feeder, four page bulletin includes a flow diagram and photograph of unit. Feeder controls and meters gas under vacuum, producing and delivering chlorine-water solution to point of application. Advantages of unit suggested are: ease of installation, accurate reading of feed rate, low maintenance, automatic safety features.

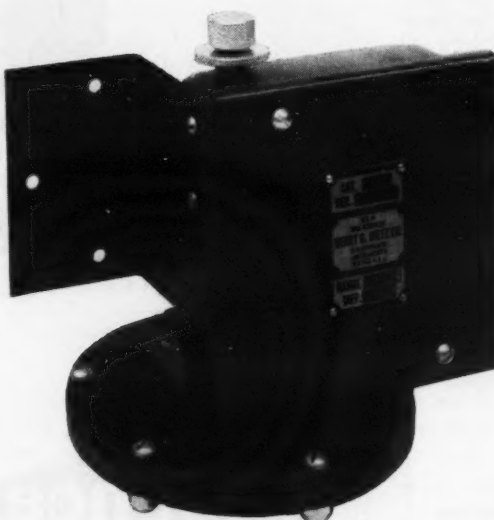
Bul 840-L23B is issued by Builders-Providence, Inc. Dept. CP, 345 Harris Ave., Providence, R.I. When inquiring specify CP 4753 on form opposite last page.

### Gives switch regulation according to inches of vacuum . . .

will act as air vacuum interlock switch to insure a specific vacuum

Uses: As air-vacuum interlock switch in equipment requiring safeguards to assure specific vacuum and prevent a hazardous condition.

Features: Vacuum control switch has on-off differential of approximately 0.15"  $\pm$  0.05" water column.



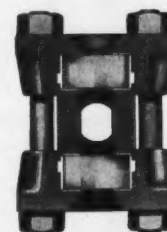
Range of vacuum control switch is adjustable by knurled knob

Description: Vacuum control switch is designed for use in installations where regulation is required in inches of water column vacuum. Controller uses a diaphragm to actuate switch. Range is adjusted by knob located outside housing.

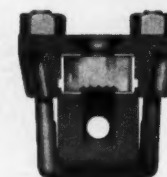
*Strahman*

## HIGH PRESSURE GAUGES

USED IN REFINERIES AND CHEMICAL PLANTS THROUGHOUT THE WORLD



THRU VISION



### REFLEX

Single or Multiple Sections

### TUBULAR

Gauge Cocks  
Large Chamber  
Reflex Gauges  
Heated or Cooled  
Gauges

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STRAHMAN VALVES, Inc.  
16 Hudson St., New York 13, U.S.A.

When inquiring check CP 4754 opposite last page

CHEMICAL PROCESSING



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# WHICH RCA TUBE FOR YOUR INDUSTRIAL EQUIPMENT?

...new "RCA  
Interchangeability  
Directory" tells you.



**RCA INTERCHANGEABILITY DIRECTORY OF INDUSTRIAL-TYPE ELECTRON TUBES** contains 16 pages of time-saving information for those who specify or purchase replacement tubes for industrial electronic equipment. Listing industrial tubes of 26 manufacturers and the equivalent RCA-type designations—approximately 2000 types in all—this DIRECTORY covers Vacuum Power Tubes, Vacuum and Gas Rectifiers, Thyatrons, Ignitrons, Magnetrons, Cold-Cathode (Glow-Discharge) Tubes, Phototubes, Oscillograph Tubes, Camera Tubes, and Receiving-Type Tubes for Industry and Communications.

Write on your company letterhead to RCA, Commercial Engineering, Section D 75 T, Harrison, N. J., for a copy of the new RCA INTERCHANGEABILITY DIRECTORY—Form No. 1D-1020A.

**RCA TUBES FOR INDUSTRY**  
Radio Corporation of America

RCA ELECTRON TUBES...LONG-LASTING, DEPENDABLE...AVAILABLE THROUGH YOUR RCA TUBE DISTRIBUTOR.

When inquiring check CP 4755 opposite last page

## INSTRUMENTATION & CONTROL

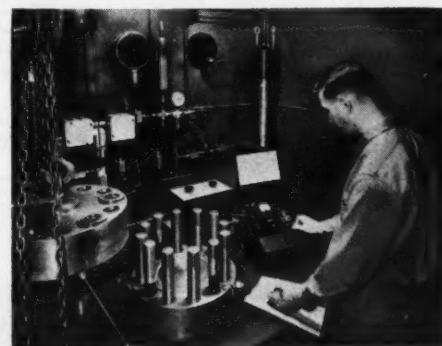
Operating point can be "locked-in". Switch action is enclosed within a molded plastic case. Switches can withstand a maximum 16" of water column pressure and a 10" water column vacuum. Electrical ratings of the SPDT are 15 amps at 120-250v AC. For best operation, switch should be mounted on a vertical surface with diaphragm in a horizontal plane. A 1/8" NPT female pipe connection is supplied.

(Cat 110 Vacuum Switch is product of The Henry G. Dietz Co., Dept. CP, 12-16 Astoria Blvd., Long Island City 2, N. Y. . . . or for more information check CP 4756 on form opposite last page.)

### Details thermistor detector for infrared radiation

Picturing thermistor infrared detectors and a typical circuit, one page bulletin also gives operating characteristics. Units are suggested for use as sensing elements in pyrometers, gas analyzers, product control instruments. Frequency response curve is given.

Optitherm Infrared Detectors is issued by Barnes Engineering Company, Dept. CP, 30 Commerce Road, Stamford, Conn. When inquiring specify CP 4757 on form opposite last page.



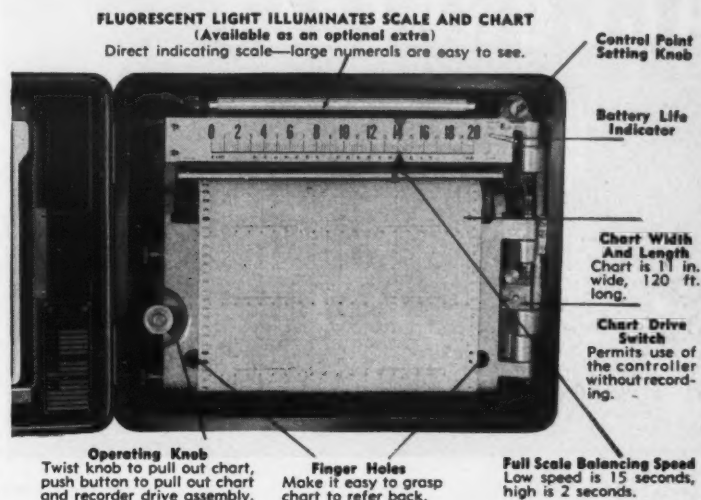
### Design of high-pressure vessels guided by strain gages

Designing closures for pressures to 16,000 psi has been simplified by C. F. Braum & Co. with strain gages. Stress measurements are made on four bolts 90-degrees apart. Strain gage indicator measures bolt stresses when top of closure is properly seated on the sealing gasket and gas or liquid pressure is applied to simulate process conditions.

(SR-4 Resistance wire strain gages are product of Baldwin-Lima-Hamilton Corp., Dept. CP, 940 Simpson St., Eddystone 42, Pa. . . . or check CP 4758)



## New Series 8000 Potentiometer-Recorder .. tops in accessibility and ease of adjustment



Accessibility and ease of adjustment were primary design considerations when Wheelco developed the new Series 8000 Potentiometer-Recorder. While every Wheelco instrument is built to function with maximum accuracy and minimum maintenance, this new null-balancing type electronic recorder was designed to be especially easy to use.

The front cover swings open 180 deg, thus permitting the chart drive to swing out a similar 180 deg, making the internal mechanism accessible. Wheelco Series 8000 Potentiometer-Recorder is available to measure, indicate, control, and give permanent record of variables such as temperature, speed, strain, hydrogen ion (pH), and any other quantities which can be resolved into electrical signals.

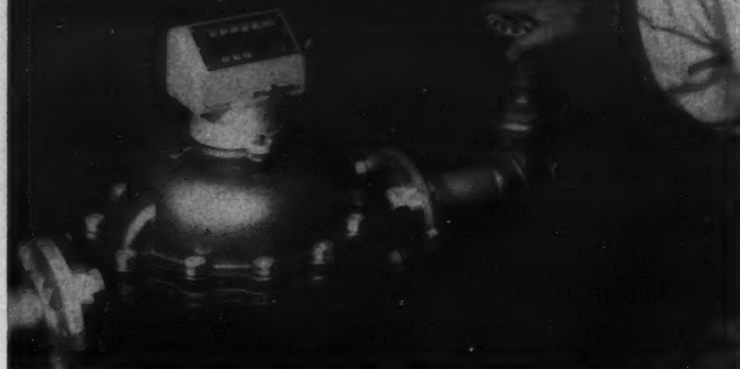
Send for new catalog which gives complete technical information on this latest Wheelco instrument.

**WHEELCO INSTRUMENTS DIVISION  
Barber-Colman Company**

Dept. F., 1520 Rock Street, Rockford, Illinois  
BARBER-COLMAN of CANADA, Ltd., Dept. C, Toronto and Montreal, Canada

When inquiring check CP 4759 opposite last page

# Measure CORROSIVE LIQUIDS ACCURATELY



## with NIAGARA Displacement Meters

Now you can apply the extreme accuracy of Niagara Meters to the measurement of corrosive liquids. Niagara Chemical Meters of Type 316 stainless steel offer good resistance to corrosion and can be used to measure caustic soda, most acids, fruit juices and similar liquids. Available in sizes 3 to 110 G.P.M. or in intermittent use up to 160 G.P.M. Niagara Chemical Meters are also available for automatic liquid measurement and liquid flow control in hazardous or non-hazardous atmospheres.

If you have corrosive liquid metering problems, let us help you. Mail coupon today.

### BUFFALO METER CO.

2892 Main Street  
BUFFALO 14, NEW YORK

Please send me information on the complete line of Niagara Meters.

Liquid.....  
Flow g.p.m..... Temp.....°F  
Name.....  
Company.....  
Address.....

When inquiring check CP 4760 opposite last page

### INSTRUMENTATION

Measures temperature  
from 330° to 1380°F  
within  $\pm 0.6\%$ ...

platinum sensing elements  
small, have fast response

Uses: Detecting temperatures ranging from  $-330^{\circ}\text{F}$  to  $+1380^{\circ}\text{F}$  in precision temperature-measuring and control systems.

Features: Elements are hermetically sealed in either 7/32" diam Pyrex glass or 1/16" diam ceramic housings. Response is accurate within  $\pm 0.6\%$ .

Description: Platinum resistance temperature detectors are small in size and have high speed re-



Detector at top contains platinum sensing element. Bottom unit is usual size

sponse. For use in pyrogen testing or general laboratory work, detectors are mounted in a 1/8" smooth stainless steel case with all leads protected by pliable rubber tubing.

(Platinum detectors are product of Fielden Instrument Division, Robertshaw-Fulton Controls Company, Dept. CP, 2920 N. Fourth St., Philadelphia 33, Penna. Check CP 4761 on form opposite last page.)

### Explains circuit design of computers

Booklet of 20 pages discusses design of computing and control circuits. Theory of operation is related to symbolic logic equivalents.

"Logical Design of Digital Computers" is issued by Computer Control Co., Inc., Dept. CP, 92 Broad St., Wellesley 57, Mass. Check CP 4762.

## King MANOMETERS

Every Size — for Every Service

### U-Type Manometers

- Single Cleanout
- Single Gland-Packed
- Double Cleanout
- Double Gland-Packed
- High Pressure

Low in price  
Trouble-free  
Easy to install  
and read

### Well-Type Manometers

- Low Well
- Raised Well
- Barometric Reading

Stay clean  
longer  
Easy to service

### Multi-Tube Manometers

- Multi-Well
- Common-Well
- Special-Purpose

**FREE LITERATURE** gives sizes, construction and prices. Write today! And ask for informative 12-page Manual on Manometers.

KING ENGINEERING PRODUCTS include King-Gages — Manometers — Self-Closing Push Valves — Pressure Transmitters — Sight Feed Bubbler — Overflow Check Valves — Air-flow Snubbers — Sediment Traps — Moisture Indicators



**KING ENGINEERING CORP.**

Box 270 • Ann Arbor, Mich.

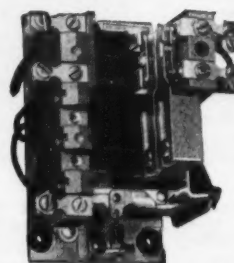
REPRESENTATIVES IN PRINCIPAL CITIES

When inquiring check CP 4763 opposite last page



and INDUSTRIAL

## CONTROLS



- Write for latest catalog covering the complete line of B/W Induction Relays, Relay Enclosures, Contactors and Starters, Multiple Pump Controls, Electrode Holders, Starter and Relay Combinations, Special Controls and Panels.

**B/W CONTROLLER CORPORATION**  
2204 E. Maple Road, Birmingham, Mich.

FIRST IN THE FLOATLESS CONTROL FIELD

When inquiring check CP 4764 opposite last page

CHEMICAL PROCESSING



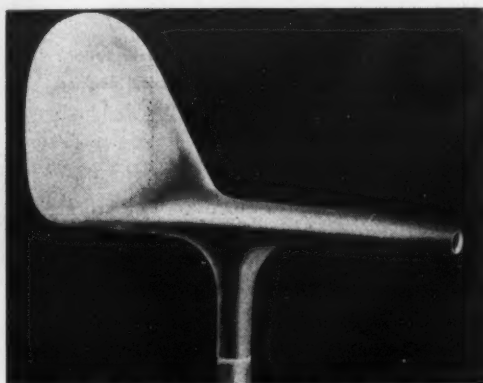
**Measures wind velocities  
and sudden peak gusts  
to 200 mph . . .**

contains no rotating cups or propellers to introduce friction and lag errors

**Uses:** As sensing instrument or component in air pollution and smog control system.

**Features:** Anemometer has rapid response. It has no rotating cups or propellers to introduce friction and lag errors in velocity readings or to fail under high velocity wind conditions.

**Description:** Sensing element is composed of short, butt-welded thermocouples that form a ther-



Anemometer is designed along aerodynamic lines

mopile — self-compensating for temperature changes. Element is located in vertical shaft so that air entering opening in nose is channeled to sensing element in such a manner that rain and foreign matter do not come in contact with it. A "bleed hole" discharges foreign material from the vane. Velocities to 200 mph can be measured.

Anemometer weighs approximately  $1\frac{3}{4}$  lb, measures 12" in length, and is 15" high, including ball-bearing mounting shaft. Instrument can be supplied with recording unit if necessary.

(Jet-Vane is product of Hasting Instrument Company, Dept. CP, Super Highway and Pine Ave., Hampton, Va. Check CP 4765 opposite last page.)

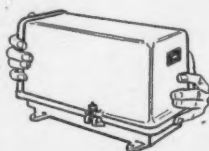
**Explains photoelectric pyrometer**

Illustrated pamphlet of four pages describes photoelectric pyrometer which operates over a range from 1000° to 5000°F with response to temperature changes of 5°F. Applications are suggested.

Bul PT556 is issued by Photoswitch Div., Electronics Corp. of America, Dept. CP, 77 Broadway, Cambridge 42, Mass. . . or for more information check CP 4766 opposite last page.

# NEW TAYLOR POTENTIOMETER TRANSMITTER

*"most practical instrument  
of its kind!"*

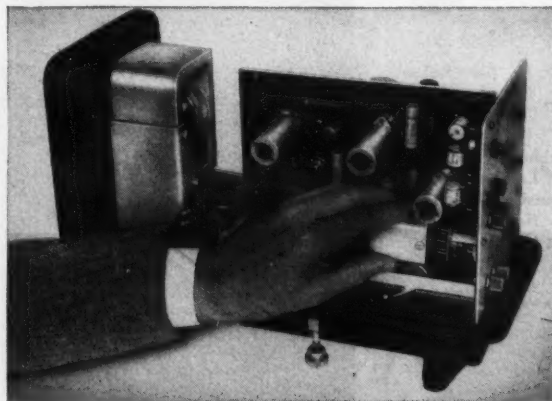


TAYLOR's years of experience and knowledge of the requirements of the processing industries are reflected in this ingenious electronic-pneumatic instrument. The TRAN-SET\* Potentiometer Transmitter can be used with a wide variety of electrical primary elements. It is

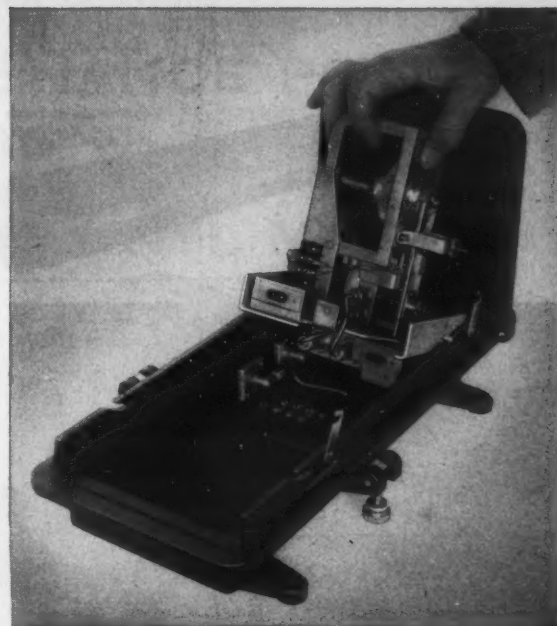
especially adaptable where conditions require pneumatic controllers and receivers and where conventional measuring circuits have not proved adequate. Check these features:

1. Automatically, Continuously Standardized with complete electronic balance, permitting optimum response adjustments. No slide wires or motor drive.
2. High Input Impedance. No need to match resistance of leads.
3. Output Impedance is practically infinite. Its 0-5 milliamp signal can perform multiple auxiliary functions without affecting accuracy of pneumatic signal.
4. Normal Load is automatically inserted when amplifier is removed for service.
5. Modern Printed Circuits insure uniform performance. Test terminals provided to simplify trouble shooting.
6. Test Jack on front panel permits easy monitoring of output current. Convenient pin jacks provided for checking standardization voltage.
7. Purged Cast-aluminum Case is moisture and corrosion proof.

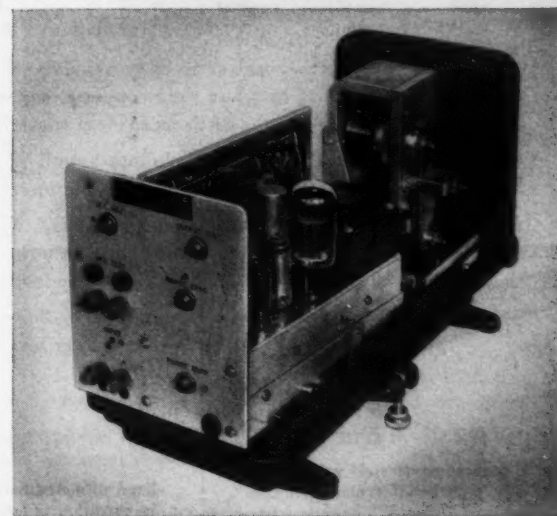
\*Reg. U.S. Pat. Off.



**Plugging in the Input Circuit Board.** It can be quickly adapted for use with different primary elements by simply plugging in the corresponding input circuit; e.g., for thermocouple applications cold junction compensation is provided in the plug-in circuit board. One instrument can therefore be used as a spare wherever a transmitting potentiometer is used.



**Plugging in the Transducer.** This exclusive plug-in feature applies to both the transducer and the amplifier. Means quick, easy removal for service; minimum instrument down-time; checking can be done in the shop where full facilities are available. Also permits separate calibration.



**Plugging in the Amplifier.** See how easily units are locked into the chassis. Also note screwdriver adjustment of range span and zero suppression by use of unique potential dividers. Exclusive Taylor vernier adjustment permits resolution of 1 part in 100,000. Transducer can be omitted when only logging and scanning or other auxiliary electrical functions are required.

Write for Bulletin No. 98262. Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada.

*Taylor Instruments*  
**MEAN ACCURACY FIRST**

When inquiring check CP 4767 opposite last page

Only the  
Right piping  
can deliver a  
"GOOD RUN"

For profitable runs you must keep equipment "on stream" full time with no corrosion shut-downs. Protect your profits with Ace piping, pumps, valves, and tanks. Many rubber and plastic materials . . . backed by a century of chemical experience. Get facts today from American Hard Rubber Company.

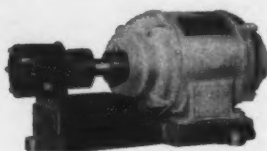
#### FOR HOT CORROSIVES:

##### ACE TEMPRON

Heat-resistant nitrile hard rubber pipe handles inorganics at 250-275 deg. F. . . also resists wide range of organic chemicals at room temperature. Sizes 1" to 8", Bulletin 96-A.

#### MIGHTY MIDGET

for pumping acids



Jabco neoprene-impeller pump made of Ace hard rubber outlasts, out-pumps anything in its pressure, size and price class. Capacity from 15 gpm. at 22 ft. head to 5 gpm. at 72 ft. head. Bulletin 97-A.

SENSITIVE,  
BUT KEEPS  
YOUR HEAD



#### ACE Darling Swing Check Valve . . .

lined with ACE hard rubber for the best in corrosion resistance. Large, straight-through flow areas. Sensitive to slight pressure differential. Non-slamming. Sizes 2" to 24". Bulletin CE-52.

#### TOUGH ACE-ITE PLASTIC PIPE

General-purpose moderately priced rubber-plastic pipe handles most common chemicals to 170 deg. F. . . except few strong acids and organic solvents. Tough, odorless, tasteless. Rigid pipe 1/2" to 6". Bulletin 80.

**ACE** processing equipment of rubber and plastics

**AMERICAN HARD RUBBER COMPANY**  
93 WORTH STREET • NEW YORK 13, N. Y.

When inquiring check CP 4768 opposite last page

#### corrosion control

*corrosive  
can't hurt*

Plastisol based on polyvinyl chloride has protected plating exhaust ducts, hoods, and blower for two years

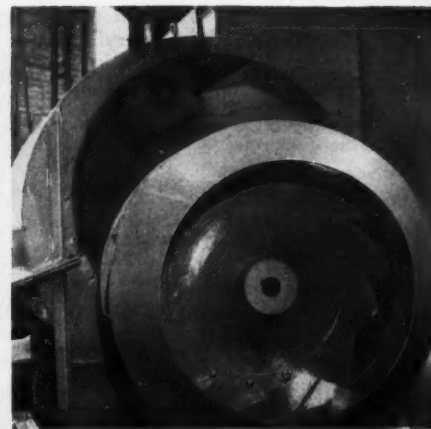
GORDON WEYERMULLER, Associate Editor  
With RICHARD BLUMBERG, Chemical Engineer  
General Electric Co., Philadelphia, Pa.

**PROBLEM:** Corrosion of former duct system for removal of plating fumes was chronic and excessively costly at General Electric Co., Switchgear Departments, Philadelphia, Pa. Of three materials used for ducts — two metallic and one non-metallic — none could satisfactorily withstand the corrosive vapors.

Fumes from following corrosives are vented:

- 1—Nitric acid and sulfuric acid in a 1:1 solution at room temperature for bright dipping copper and brass.

Section of PVC-coated duct for plating fumes at General Electric



PVC was sprayed on blower used for venting the corrosive vapors



## acids and caustic PVC-coated ducts

- 2—Sodium hydroxide, 20% at 160°F.  
3—Muriatic acid, conc. and 1:1 at 150°F.  
4—Water at 200°F.

**Solution:** In the spring of 1954 exhaust system coated with a plastisol based on polyvinyl chloride resin was placed in service at G-E. PVC coating was applied by dipping sheet metal ducts and hoods to a thickness of 0.03 to 0.05 inches. Large exhaust blower on roof was sprayed with approximately the same thickness of the PVC coating. Coatings were heat cured.

**Results:** Present PVC-coated ducts, hoods, and blower have carried the corrosive vapors continuously for the past two years without a sign of deterioration.

(Installation was made by and PVC plastisol coating is product of Quelcor, Inc., Dept. CP, Front & Broomall St., Chester, Pa. . . . or for more information check CP 4769 on form opp. last page.)

(Plastisol coating used is based on Exon 654 resin, a product of Firestone Plastics Co., div. Firestone Tire & Rubber Co., Dept. CP, Pottstown, Pa. . . . or check CP 4770 opposite last page.)

(Blower is product of The New York Blower Co., Dept. CP, 3155 S. Shields St., Chicago 16, Ill. . . . or check CP 4771 on form opposite last page.)



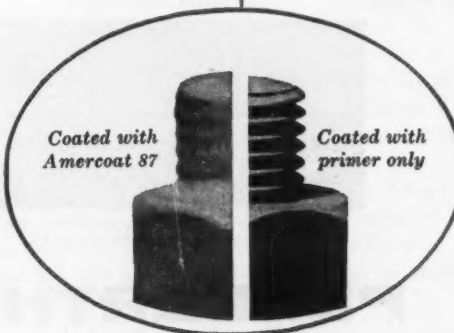
Exhaust hoods over acid plating tanks are also coated with PVC

## you can CUT YOUR MAINTENANCE PAINTING COSTS UP TO 50% *with* AMERCOAT 87 VINYL MASTIC



HERE IS HOW THIS REMARKABLE PROTECTIVE COATING CAN SAVE YOU MONEY:

1. Only one cross spray coat over a primed surface is required for complete protection—this means lower labor costs.
2. Fewer scaffolding and rigging shifts are required.
3. Less down time—dries to touch in minutes, eliminates the risk of contamination between coats.
4. Greater thickness means longer life—lower cost per square foot per year.



Amercoat 87's thixotropic characteristic helps provide extra thickness on sharp edges and irregular surfaces; it is non-porous and will not crack or check.

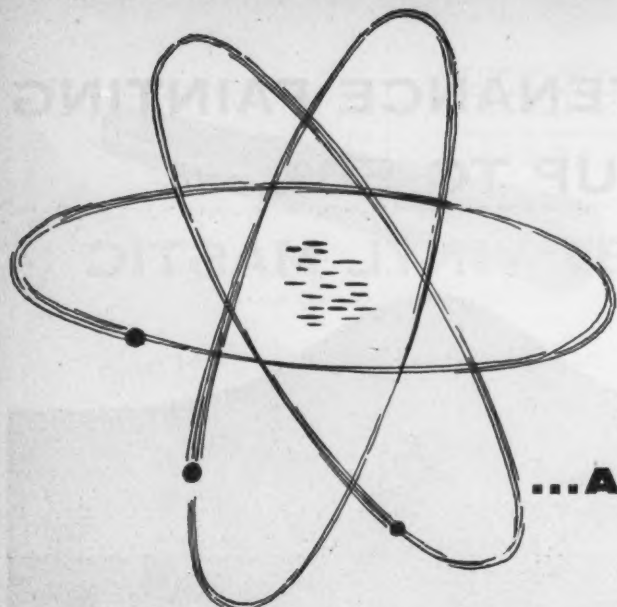
Amercoat 87 combines the time-tested chemical and weather resistance of vinyl coatings with the thickness of conventional mastics, yet is easily applied with standard industrial spray equipment.

We will be pleased to send you our technical bulletin describing this coating in detail.

**Amercoat**  
CORPORATION

DEPT. PD 4809 FIRESTONE BOULEVARD, SOUTH GATE, CALIFORNIA Evanston, Ill. • Kenilworth, N.J. • Jacksonville, Fla. • Houston, Tex.

When inquiring check CP 4772 opposite last page



## Simplify Handling of Fluids, Vapors and Gases ...AND "HOT" MATERIALS

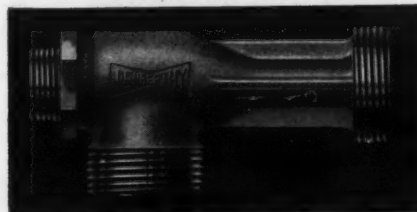
Selected for use in certain Atomic Energy Commission operations, the simple sound design of Penberthy ejectors plus Penberthy "know-how" has provided dependable service in processes involving the handling of dangerous corrosive liquids and gases. These same advantages are being realized in chemical processing, dairy, food, textile, plating, paper and many other industries.

Trouble-free Penberthy ejectors (with no moving parts to get out of order) are available in bronze, iron, stainless steel, plastic and other materials . . . in standard and made-to-order designs. Get the facts. Write for Catalog 512R.

**PENBERTHY INJECTOR COMPANY**  
Division of the Buffalo-Eclipse Corporation  
1242 Holden Avenue Detroit 2, Michigan



Series 1A and 20A Ejectors perform efficiently over a wide range of operating conditions.



Series 60A fluid operated jet pump for lifting, elevating and blending liquids or slurries.



Special jet pump for handling corrosive chemicals. Stainless steel with flanged connections.



Special stainless steel where corrosion resistance and/or non-contamination are required.

Series 60 P corrosion-resisting Uscolite plastic hydraulic ejector. Rigid. Tough. Lightweight.

## PENBERTHY EJECTORS

### STEAM, AIR & LIQUID OPERATED FOR:

Liquid Transfer, Heating, Circulating, Aerating,  
Agitating, Mixing, Pumping, Blending and Exhausting Air  
or Vapor against High Vacuum.

There's Certain Satisfaction in **PENBERTHY** Cycling Jet Pumps • Ejectors • Injectors • Electric Sump Pumps

When inquiring check CP 4773 opposite last page

## CORROSION CONTROL

### Spray ammonium nitrate prills In all-aluminum tower

Using a special aluminum alloy to withstand effects of atmospheric corrosion and to give structural strength, Brea Chemicals, Inc., of Brea, California, has constructed an all-aluminum 200 ft prilling tower. This tower, one of a number of prilling towers throughout the country constructed of aluminum, is a good example of how aluminum is used to control corrosion in an industrial atmosphere. It is of interest to note that the aluminum tower also resists the damaging effects of ammonium nitrate.



Aluminum prilling tower at Brea Chemicals withstands the effects of atmospheric corrosion as well as ammonium nitrate

Concentrated ammonium nitrate is sprayed through a series of spray heads at top of the spray tower. Droplets solidify to form ammonium nitrate prills, which are small spherical particles. An air scrubbing system is installed at the top of the tower to eliminate pollution and smog problems. Tower was fabricated in standard 12 ft high panels to facilitate field erection.

(Aluminum sheet is product of Kaiser Aluminum & Chemical Corporation, Dept. CP, 1924 Broadway, Oakland 12, Calif. . . . or for more information check CP 4774 on form opposite last page.)

### Reference on corrosion-resistant fabricated alloy products

Corrosion-resistant and heat-resistant fabricated alloy products are described in 34-page reference book. More than 200 illustrations accompanying descriptions make this manual comprehensive. Variety of processing equipment is shown.

Cat G-10 is issued by Rolock Incorporated, Dept. CP, 1350 Kings Highway, Fairfield, Conn. When inquiring reader may simply specify CP 4775 on form which is located opposite last page.



**Temperatures up to 750°F  
resisted by coating  
without baking . . .**

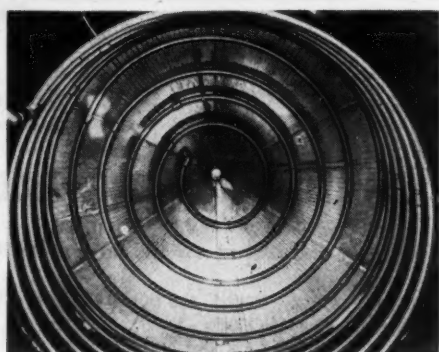
air dries to a smooth, black finish in eight to ten hours

**Uses:** For protection of heat lines, radiators, condensers, compressors, turbines, boilers, stacks, and other equipment at moderately high temperatures.

**Features:** Coating provides protection at temperatures up to 750°F without baking.

**Description:** Coating is composed of a black pitch base bolstered with a silicone additive. This combination provides a heavy-bodied coating that does not blister or become brittle when subjected to varied temperatures, smoke, fumes, mild industrial acids, alkalis, and moisture. Coating dries to a smooth finish in 8 to 10 hours. It can be applied by brush or spray.

(HSE coating is product of Speco, Inc., Dept. CP, 7308 Associate Ave., Cleveland 9, Ohio . . . or for more information reader may simply check CP 4776 on the convenient Reader Service slip which is located opposite last page.)



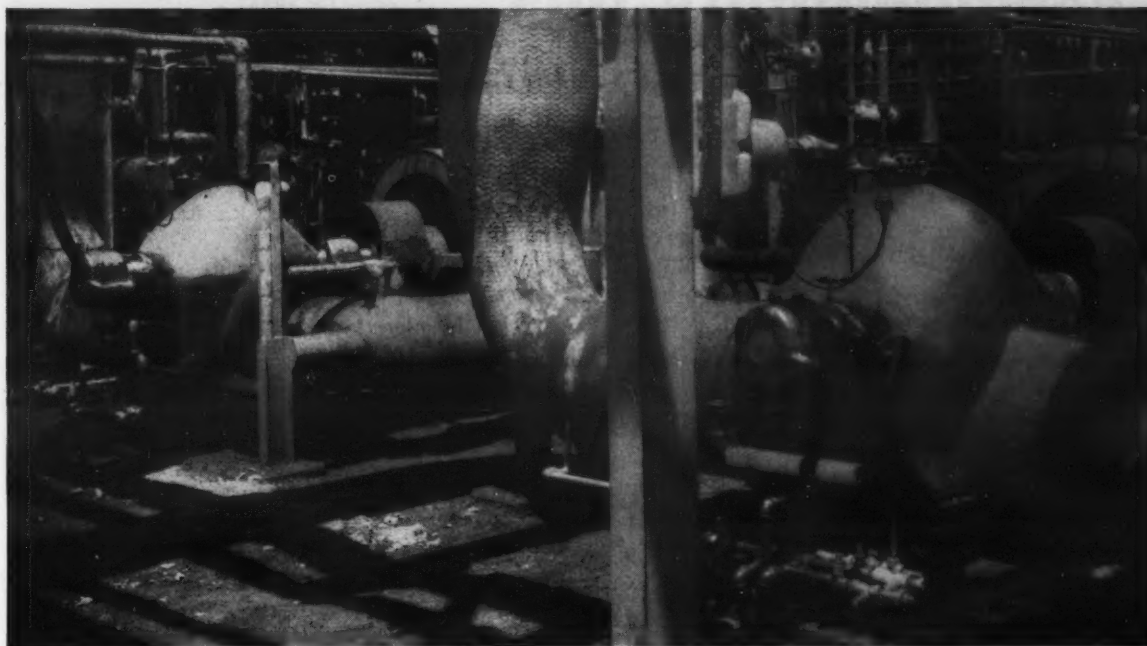
#### Wrought Iron Resists Corrosion

Subject of this deceptive camera study is neither a gigantic watch spring nor the interior of a laboratory test tunnel—but it is a topside view of wrought iron heating coils serving one of the process and oil blending tanks at the Lever Brothers Company plant at Los Angeles, California. Approximately 100 tons of wrought iron pipe are used in coil applications at the plant to provide protection against premature deterioration from corrosive elements in the blending process.

(Wrought iron pipe is product of A. M. Byers Company, Dept. CP, Clark Bldg., Pittsburgh, Pa. . . . or for more information concerning advertisers product reader may simply check CP 4777 on the convenient form opposite last page.)

## Allis-Chalmers

# PUMPS Solve a Chemical Industry Problem



## All-Stainless-Steel Pumps Handle Hot Corrosive Liquids

Manufactured on duty-specifications from the customer, these Allis-Chalmers Type SG stainless steel pumps are successfully handling a highly corrosive mixture of carbonate, urea, oil, and water at 260 F.

This is another example of the way Allis-Chalmers serves the chemical industry with a wide range of types of pumps in all sizes. These versatile, high efficiency Allis-Chalmers pumps are available in many special materials to meet specific application requirements.

**For full information** on how Allis-Chalmers can help you reduce costs, contact your local Allis-Chalmers district office, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.



A-4983

# ALLIS-CHALMERS

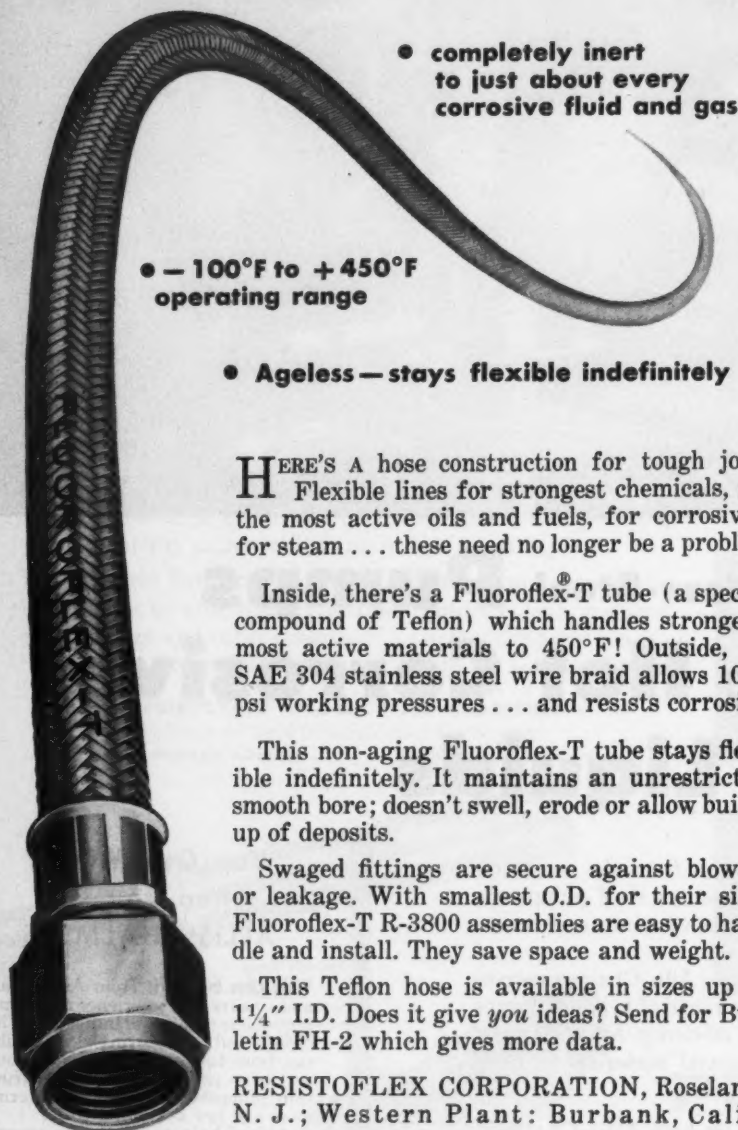
**You Get MORE  
when you Get  
ALLIS-CHALMERS**

**You can benefit** from Allis-Chalmers years of experience in pump manufacturing for all industries. The design and engineering skill resulting from this experience is at your service — you get special construction pumps that give top performance and low operating costs.

Allis-Chalmers industry-experienced engineers will help you select exactly the Allis-Chalmers pump to meet your needs, and Allis-Chalmers can furnish a complete pump unit—pump, motor, and control.

When inquiring check CP 4778 opposite last page

# Look at the serviceability this **TEFLON®** hose offers



• completely inert to just about every corrosive fluid and gas

• - 100°F to + 450°F operating range

• Ageless — stays flexible indefinitely

**H**ERE'S A hose construction for tough jobs. Flexible lines for strongest chemicals, for the most active oils and fuels, for corrosives, for steam . . . these need no longer be a problem

Inside, there's a Fluoroflex®-T tube (a special compound of Teflon) which handles strongest, most active materials to 450°F! Outside, an SAE 304 stainless steel wire braid allows 1000 psi working pressures . . . and resists corrosion

This non-aging Fluoroflex-T tube stays flexible indefinitely. It maintains an unrestricted smooth bore; doesn't swell, erode or allow build-up of deposits.

Swaged fittings are secure against blowoff or leakage. With smallest O.D. for their size, Fluoroflex-T R-3800 assemblies are easy to handle and install. They save space and weight.

This Teflon hose is available in sizes up to 1 1/4" I.D. Does it give *you* ideas? Send for Bulletin FH-2 which gives more data.

**RESISTOFLEX CORPORATION**, Roseland, N. J.; Western Plant: Burbank, Calif.

IF IT'S NEWS IN  
TEFLON HOSE — IT'S SURE TO BE  
FLUOROFLEX-T

## RESISTOFLEX

CORPORATION

ROSELAND, N. J. • WESTERN PLANT: BURBANK, CALIF.

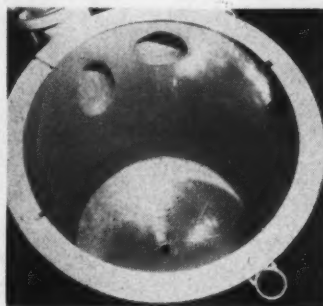
When inquiring check CP 4779 opposite last page

## CORROSION

**Serves as lining for tanks**

**Uses:** As a corrosion-resistant lining for tanks, vessels, reactors, drums, pails, pipe, chutes, hoppers, fume hoods, and ducts.

**Features:** Laminate can be adhesive-bonded to almost any contoured surface. Vessels rang-



Alternating exposure to highly corrosive contents at temperatures ranging from 32 to 324°F, and to abrasion and impact from rapidly moving chunks of ice did not affect the fluorocarbon plastic laminate used as lining in this 75-gal acid quench tank

ing from rectangular plating tanks to complex reactors involving flanged pipe connections and dished heads, have been lined with the material.

**Description:** Laminate consists of a thin — 10-12 mil — continuous layer of Kel-F plastic on glass cloth. Kel-F has excellent resistance to a wide variety of chemicals and solvents at temperatures approaching 400°F. It also has good abrasion and impact resistance.

(Kel-F plastic laminate lining is development of The M. W. Kellogg Co., Sub. of Pullman Inc., Dept. CP, P.O. Box 469, Jersey City 3, N.J. However, Kellogg does not manufacture these laminates.)

(Plastic laminate linings are produced by Garlock Packing Co., Dept. CP, Palmyra, N.Y. . . . or check CP 4780.)

(Plastic laminate linings are also produced by U.S. Gasket Co., Dept. CP, Camden 1, N.J. . . . or check CP 4781.)

## Using **TYGON** "ATD" Hot Spray PAINT



**TWO COATS DO THE WORK OF FIVE**

Using Tygon ATD Hot Spray Vinyl Paint you deposit a smooth, run-free 5 mil thick vinyl film in just two passes—equal to five coats of cold sprayed paint! The finished job has excellent adhesion and outstanding corrosion resistance.

Since two coats do the work of five — and since no thinners are needed — and since reduced overspray materially reduces paint loss . . . your savings in time and materials are substantial!

Actually, Hot Spray Painting with Tygon ATD offers cost cutting advantages unequalled by any other method.

Write today for Bulletin ATD-9

PLASTICS AND SYNTHETICS DIVISION

**U. S. STONWARE**  
AKRON 9, OHIO

204E

When inquiring check CP 4782 opposite last page

**When plans call for**



## CORROSION RESISTING VESSELS

custom fabricated on the West Coast

**YOU'LL SAVE TIME, TROUBLE, AND MONEY BY CONTACTING PUGET SOUND FABRICATORS**

Your "on the spot" source with over 55 years of experience in handling a wide variety of fabricating jobs involving steel plate and alloys up to 1" thickness

**SUPPLY PRINTS FOR PROMPT QUOTATION ON YOUR NEXT JOB**



**REQUEST NEW BROCHURE** for complete information on facilities and services write for Brochure No. M-56



**Craftsmen in Metals Since 1900**  
**PUGET SOUND FABRICATORS, INC.**

3670 E. Marginal Way Seattle 4, Wash.

When inquiring check CP 4783 opposite last page

CHEMICAL PROCESSING

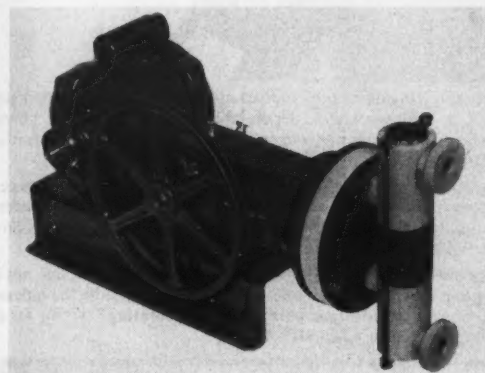


**Only Teflon contacted  
by liquid handled  
in pump . . .**

unit is suitable for corrosives up to 300°F

**Uses:** For pumping acids of full or medium concentration, alkaline solutions, petroleum hydrocarbons, and mixtures of these chemicals at -50° to 300°F.

**Features:** Liquid pumped does not contact any material other than Teflon.



Chemical pump has sufficient dry lift to eliminate initial priming

**Description:** Positive displacement pump of diaphragm type has pump head, valve components, connecting flanges, and nipples all made of solid Teflon. Pump is hermetically tight. There are no packing glands or rotary seals to leak fumes. Pump will pass about 10% of capacity as gas or air without losing its prime. It has sufficient dry lift to eliminate initial priming. Since it requires no lubrication from the liquid being pumped, it will run dry without harm. Capacity of pump is 300 gph and maximum total head 40'.

(Model 100-C pump is product of O.K. Machine & Tool, Inc., Dept. CP, Waco, Texas. Check CP 4784 on form opposite last page.)

#### **Brazing and processing stainless steel**

Four-page bulletin describes proper procedures for brazing and processing stainless steel assemblies. Alloy which resists heat and corrosion is used to braze the stainless. Bulletin is well illustrated with photographs and charts.

Form SD-21 is issued by Stainless Processing Div., Wall Colmonoy Corp., Dept. CP, 19345 John R. St., Detroit 3, Mich. When inquiring specify CP 4785 on form opposite last page.

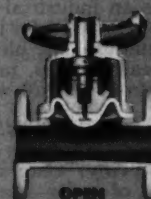
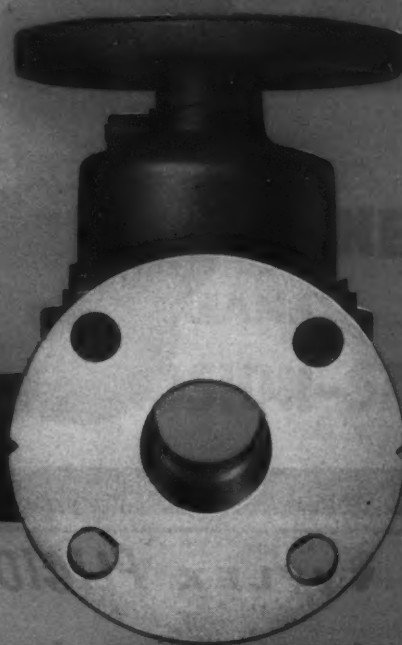
**Announcing...  
the new,  
exclusive**

**GRINNELL-  
SAUNDERS**

**STRAIGHTWAY**

**DIAPHRAGM  
VALVE**

... the diaphragm valve with  
**STRAIGHT-THROUGH FLOW,**  
for handling viscous materials,  
fibrous slurries, sludges, pulp  
stock, latex, magmas, semi-fluid  
foods, solids in suspension,  
sewage, water, corrosive chemicals



**OPEN**  
Diaphragm lifts high for  
streamline flow in either  
direction. No pockets to  
trap sludge



**CLOSED**  
Diaphragm presses tight  
for positive closure even  
when handling gritty or  
fibrous materials

Grinnell-Saunders **STRAIGHTWAY** Diaphragm Valve\* offers you these exclusive features: the ability to handle viscous materials without restriction or stoppage; minimum pressure drop; rodding or brushing without need of removing bonnet and without possibility of damaging body linings; self-draining when line is pitched sufficiently to drain piping.

Grinnell-Saunders **STRAIGHTWAY** Diaphragm Valves are available in a range of body, lining and diaphragm materials. Inquiries invited. Bulletin on request.

\*Patented

#### **GRINNELL COMPANY, INC.**

236 West Exchange St., Providence, R. I.

Kindly send me a complimentary copy of your "Grinnell-Saunders Straightway Diaphragm Valve" bulletin.

Name \_\_\_\_\_

Title or function \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_



Grinnell Company, Inc., Providence, Rhode Island

Coast-to-Coast Network of Branch Warehouses and Distributors

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves  
Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies  
industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems

When inquiring check CP 4786 opposite last page



## VYFLEX **FLIGID**® lining stops sodium hypochlorite

The problem solved by lining the tank shown above with Fligid is particularly important because it is so widespread. Invaluable as an industrial bleach, sodium hypochlorite has a voracious appetite for just about every known lining or coating material. The bleach decomposes some on contact. It permeates others, raising gas blisters that force the lining away from the tank wall.

But nothing happens to *Fligid*! Sodium hypochlorite is completely powerless against this amazing new laminate of two different Polyvinyl Chloride based membranes. Furthermore, the cost of lining a tank with Fligid is negligible compared to the cost of replacing the tank.

The exposed face of *Fligid* is unplasticized PVC, able to resist the widest range of corrosives, at temperatures to 190 F in many solutions. There's no plasticizer to leach out and contaminate reagents. And this outer face is harder and more abrasion resistant than any other lining material. The inner face is resilient, flexible PVC, easily applied to steel, wood, or concrete, by simple adhesive bonding techniques with no curing. Qualified Kaykor applicators across the United States and Canada give fast, professional service applying *Fligid* to any size or shape structure in the field or in the shop.

**GET THE FACTS!** Write now for the complete story, including all technical data, in the just published technical sheet "Fligid"... free on request to Kaykor Industries, Inc., 4401 Broad Street, Yardville, New Jersey.



**KAYKOR INDUSTRIES, INC.**  
Division of Kaye-Tex Manufacturing Corp.  
YARDVILLE, NEW JERSEY

When inquiring check CP 4787 opposite last page

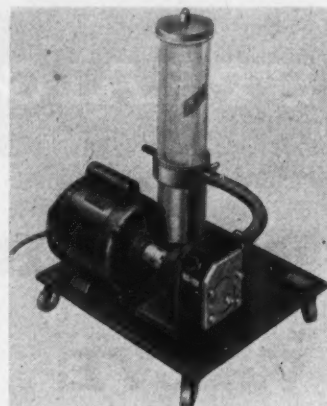
## CORROSION

### Plastic filter pumps are self-priming

**Uses:** For filtration of corrosive solutions.

**Features:** Pump is available in a variety of plastics to meet requirements. Unit is self-priming. It will remove particles down to one micron in size.

**Description:** Unit consists of a plastic pump and a plastic filter assembly mounted on a linen-impregnated phenolic panel and coupled to a totally-enclosed, 1/4-



Pump is available in variety of plastics

hp motor. Portability is obtained by the use of rubber-tire, ball-bearing casters. Filter pump is available in 50, 100, and 200 gph sizes. Each portion of pump is available in a number of different plastic materials.

(LBNI filter pump series is product of Sethco Mfg. Co., Dept. CP, 70-78 Willoughby St., Brooklyn 1, N. Y. Check CP 4788 opp. last p.)

### PVC pipe, fittings

Illustrated, 12-page pamphlet shows the physical properties, uses, and specified dimensions of PVC pipe and fittings. Installation instructions are included.

Bul PE-40 is issued by Corning Glass Works, Dept. CP, Corning, N.Y. Specify CP 4789 opposite last page.

## Want to forget about rust for 20 years?



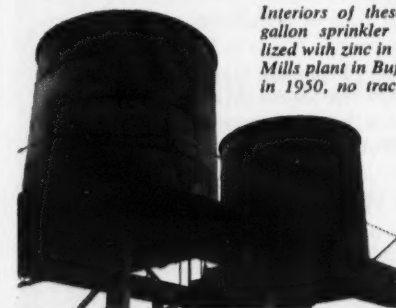
Pure zinc or aluminum, molten-sprayed on iron or steel surfaces, provides positive, dependable protection against atmospheric corrosion for upwards of 20 years without any further maintenance.

These unique coatings are mechanically bonded to the surface—adhesion is not dependent on volatile vehicles or binders. Scaling, crazing, blisters are eliminated. Protection is positive. "Metallize 'em and forget 'em!"

Why not find out more about how you can forget about rust on iron and steel structures and equipment—eliminate the nuisance and expense of constant painting and repainting? Write for descriptive Bulletin 62-B—it's free.

### the Metco\* Systems

—a series of 18 basic engineering specifications developed over 19 years of experience with pure zinc and aluminum coatings on many different types of structures and equipment in a wide range of corrosive conditions. The *Metco Systems* provide for standardization of surface preparation, coating thicknesses and organic aftercoatings for various surface conditions and appearance requirements.



Interiors of these two steel 15,000 gallon sprinkler tanks were metallized with zinc in 1934 at the General Mills plant in Buffalo. Last inspected in 1950, no trace of rust could be found, and zinc remaining is expected to provide protection for an additional 15 to 20 years.



### Metallizing Engineering Co., Inc.

1143 Prospect Ave., Westbury, L. I., New York • cable: METCO  
In Great Britain:  
METALLIZING EQUIPMENT COMPANY, LTD.—Chobham near Woking, England

### DON A. WATSON METALLIZING ENGINEERING CO., INC.

1143 Prospect Ave., Westbury, Long Island, N. Y.

- ☐ Please send me, without obligation, Bulletin 62-B.  
☐ Please have Metco Field Engineer call.

NAME \_\_\_\_\_

COMPANY \_\_\_\_\_

STREET \_\_\_\_\_

CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

When inquiring check CP 4790 opposite last page

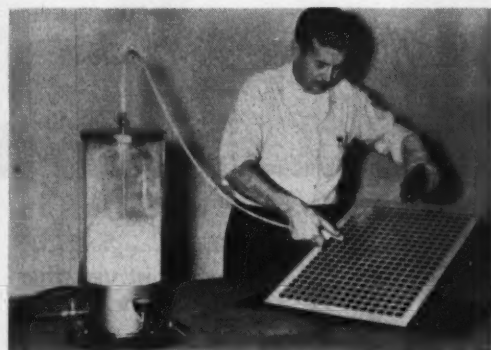
CHEMICAL PROCESSING



### Modified fluidizing equipment permits spraying of targets with polyethylene . . .

gives on-the-spot corrosion protection to large diameter objects

Modification of fluidizing equipment permits spraying of targets with polyethylene and other plastics which cannot be accommodated by the basic dipping technique. Fluidizing equipment is fitted with a fluid-powder spray unit over the top of the fluidizing chamber. Where the size of the object to be coated exceeds the diameter of the chamber, or where certain



Large object is sprayed with polyethylene by modified procedure

interior surfaces prohibit maximum benefits from immersion, spray unit is affixed to allow the powder to flow through flexible hose and emerge through an easily-manipulated spray-pattern control. There is no limit to the size of object to be coated other than limitations of preheating facilities.

(Fluidizing coating process is development of American Agile Corp., Dept. CP, 5461 Dunham Rd., Maple Heights, Ohio . . . or for more information check CP 4791 on form opposite last page.)

### How to prevent corrosion in cooling towers

Two-page bulletin explains how synergized polyphosphates and lower pH conditions prevent scale and corrosion in cooling tower systems. System described is effective in protecting cooling towers using hard-to-treat water which has organic or sewage contamination, high sulfate or chloride concentration, or suspended or soluble iron.

Bul C1 is issued by National Aluminate Corp., Dept. CP, 6294 W. 66th Pl., Chicago 38, Ill. When inquiring specify CP 4792 on form opposite last page.



### "BUFFALO" RUBBER-LINED FUME EXHAUSTERS

Because corrosive fumes cannot react on surfaces they do not contact, these fans last many times as long as ordinary steel exhausters.

Rubber is vulcanized to the inlet, shaft, rotor and inside of housing of these "Buffalo" Exhausters. Strength of adhesion is over 700 lbs. per square inch, with no seams or cracks where corrosive fumes can penetrate. And due to the resiliency of the rubber, there is no possibility of separation, hardening or cracking from differences in expansion. Savings in fan parts and down-time pay for the extra cost of the rubber in a hurry.

This is just one of a variety of "Buffalo" Fans you may order rubber-lined. We also build fans in stainless steel, or with a choice of other protective coatings on request — all with the famous "Q" Factor\* of efficient, smooth, long-lived performance that has made "Buffalo" the top fan buy for 79 years.

## RUBBER-LINED MEANS CORROSION-SAFE

### handling these and other fumes:

Sulphuric	Oxalic
Sulphurous	Tartaric
Carbonic	Formaldehyde
Hydrobromic	Muriatic (Hydrochloric)
Hydrofluoric	Zinc Sulphate
Phosphoric	Ferrous Chloride
Pyroligneous	Caustic Potash
Acetic	Calcium Hypochlorite
Citric	Copper Sulphate
Tannic	Zinc Chloride
Chlorine	Ferrous Sulphate
	Sodium Acid Sulphate

\*The "Q" Factor — the built-in Quality which provides trouble-free satisfaction and long life.

WRITE FOR BULLETIN 2424F TODAY!



## BUFFALO FORGE COMPANY

BUFFALO, NEW YORK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

VENTILATING	AIR CLEANING	AIR TEMPERING	INDUCED DRAFT	EXHAUSTING
FORCED DRAFT	COOLING	HEATING	PRESSURE BLOWING	

When inquiring check CP 4793 opposite last page

# WHAT KILLS YOUR PUMPS?

CORROSION...ABRASION...VIBRATION?

Heavy rubber or special linings molded in the case to resist corrosion and abrasion

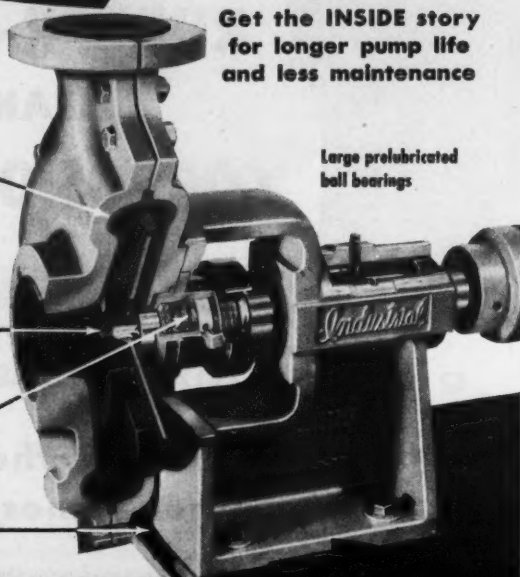
One-piece molded impeller and oversized shaft prevent oscillation

Easy access to corrosion-proof stuffing box

Rubber covered base

Get the INSIDE story for longer pump life and less maintenance

Large prelubricated ball bearings



## Industrial RESISTS ALL 3

Lined to suit the job... the rubber formula most resistant to the fluids you handle can be supplied by INDUSTRIAL'S rubber compounding and lining division. Neoprene, Saran, Hypalon and Hycar are also available. INDUSTRIAL'S experienced chemists and engineers will help you select the ideal lining and pump size.

Wide range of sizes available with capacities to 450 gpm.

Write for 8-page bulletin with head, GPM and efficiency graphs.

CENTRIFUGAL PUMPS • PRESSURE FILTERS • ION AND HEAT EXCHANGERS • RUBBER LININGS • WASTE TREATING EQUIPMENT

Industrial

## INDUSTRIAL

### FILTER & PUMP MFG. CO.

5908 Ogden Avenue • Chicago 50, Illinois

When inquiring check CP 4794 opposite last page

## CORROSION

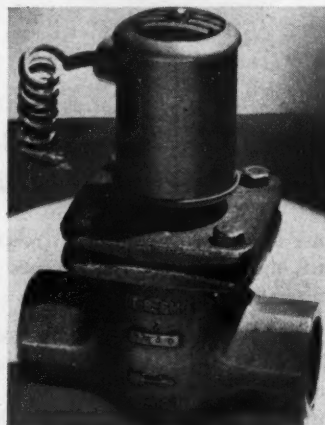
**Stainless construction, Teflon discs features of solenoid valves...**

designed to eliminate hammer or shock

**Uses:** Automatic or remote control of chemicals, steam, air, gas, and other liquids.

**Features:** Units have stainless steel construction, renewable Teflon discs, full ports, stainless piston rings, and packless operation for a wide range of pressures. They are designed to eliminate hammer and shock.

**Description:** Valves are normally-closed and normally-open types in 1¼, 1½, and 2" sizes. Waterproof molded coils are de-



Solenoid valve is available in corrosion-resistant materials

signed for temperatures to 250°F, silicone insulated coils for higher temperatures.

(Stainless solenoid valves are a product of J.D. Gould Co., Dept. CP, 730 E. Washington St., Indianapolis 2, Ind. . . . or check CP 4795 opposite last page.)

Your guide . . . to more corrosion control ideas and materials is the alphabetical product directory beginning on page 225 in this issue

## AGILE'S Plastic Ductwork Costs Less...Has Longer Service Life Than Stainless Steel



### AGILE'S Plastic Installation

- Cost ..... \$491.00
- Service ..... Still in use after 3 years

### Stainless Steel Installation

- Cost ..... \$581.00
- Service ..... only 16 months

**PROBLEM:** This company was using a type 19-9 stainless steel stack for venting the fumes on a sulphuric acid tank. This stack was installed at an original cost of \$581, was no longer serviceable after 16 months because of corrosion.

**SOLUTION:** The company replaced the stainless steel installation with a plastic structure of equal dimensions for \$491.00. The new stack still in perfect condition, has a life expectancy of many, many years.

Whenever you have a corrosion problem, check with American Agile. Many years of research and wide practical experience have made American Agile experts in the fields of plastics and corrosion prevention.

For detailed information be certain to write for your free brochure. AA-4



## AMERICAN AGILE CORPORATION

Plant and General Offices • 5461 DUNHAM RD. • MAPLE HEIGHTS, O.  
Mailing Address, P. O. BOX 168 • BEDFORD, O.

When inquiring check CP 4796 opposite last page

CHEMICAL PROCESSING



**Silicone-aluminum paint,  
for 1500°F, air dries  
in 30 min . . .**

protects against corrosion on exhaust stacks

**Uses:** For protecting smoke stacks, furnaces, and other equipment subject to high temperatures.

**Features:** Coating will air dry in approximately 30 min, then withstand temperatures up to 1500°F.

**Description:** Coating is based on a silicone alkyd resin base and contains Alcoa aluminum pigments. It is packed ready for use and may be applied with brush or spraying equipment. All surfaces to be coated must be clean and free from grease, and should not be hot when painted.

A high heat resisting finish made with silicone is also available in various colors.

(Alumicone paint is product of Atech, Inc., Dept. CP, 3840 Lagrange St., Toledo 12, Ohio . . . or for more information check CP 4797 on form which is located opposite last page.)



**Stainless steel salt spray test cabinet  
shows no visible corrosion after 5 years**

A 316 stainless steel cabinet for testing samples of steel under a 20% salt spray has been in continuous use since February 1, 1951, at the Brackenridge (Pennsylvania) labs of Allegheny Ludlum Steel Corp. and still shows no visible corrosion. Five years is the longest period that any steel has been subjected to a continuous spraying by 20% brine as far as is known. Research chemist Perry R. Bush is shown checking samples in cabinet.

Information courtesy Allegheny Ludlum Steel Corp., Dept. CP, Pittsburgh 22, Pa.

# COAL TAR + EPOXY = TARSET®

**How Can YOU Use this Important New Protective  
Coating in Your Plant?**

Perhaps no other protective coating in the world today combines the broad corrosion-resisting properties and relative low cost of newly developed *Pitt Chem* "Tarset." A unique combination of two proven corrosion-fighters—coal tar pitch and epoxy resin—Tarset offers unusual resistance to most salts and acids, crude oil and petroleum products, and to general industrial atmospheres.

Tarset is exceptionally tough. It does not shatter or loosen when subjected to extreme impact tests. It withstands temperatures as low as -30°F. and as high as 400°F. It adheres to metal better than any other coating of its type and can be applied by spray, brush or roller.

*What can Tarset do for you?* If you have a stubborn corrosion problem that must be solved within definite economic limits, *Pitt Chem* Tarset may be the material you're looking for. In any case, we'll be glad to send you complete technical data and samples for testing. *Write or call today.*



**Send for Descriptive Booklet  
on TARBOL today**

Free booklet tells how to use amazing new Tarset to reduce costly corrosion. Gives detailed description of Tarset's specifications, properties and application characteristics. Write for *your* copy today!



In the petroleum industry, Tarset has already proved its ability to stop severe corrosion caused by salt water and sulphur compounds in crude oil storage.



COAL CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

When inquiring check CP 4798 opposite last page

**TANTALUM...**  
 If you don't need it,  
 you can't afford it.  
 If you need it, you can't  
 afford to do without it!

It is an easy matter to determine whether or not you need tantalum in your process. If tantalum eliminates shut-down, product contamination, side reactions, fume damage and other waste due to corrosion, *you need it!*

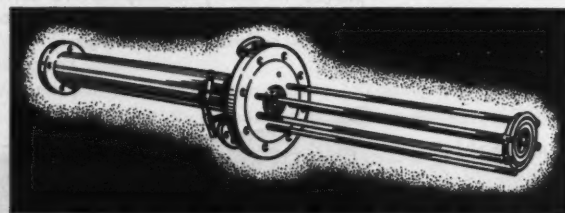
If Tantalum increases equipment life four-fold, or more, even if it costs only twice as much...you need it!

Tantalum is immune (not merely resistant) to any of the following: hydrochloric acid, nitric acid, perchloric acid, bromine, iodine, hydrogen peroxide, chlorine, chlorine dioxide and many others. It is so slowly attacked by sulfuric acid that life may be measured in decades. It is strong, immune to thermal shock, unequalled in heat transfer efficiency.

Fansteel engineers can evaluate the pros and cons of tantalum very precisely as they apply to your process. From that point, it will be very easy for you to reach your own conclusions.

**USE TANTALUM WITH ECONOMY** for most acid solutions and corrosive gases or vapors.

Not recommended for HF, strong alkalis or substances containing free SO<sub>3</sub>.



Write for free **TANTALUM** booklet today!

**FANSTEEL METALLURGICAL CORPORATION**  
 Chemical Equipment Division  
 NORTH CHICAGO, ILLINOIS, U.S.A.

G562A

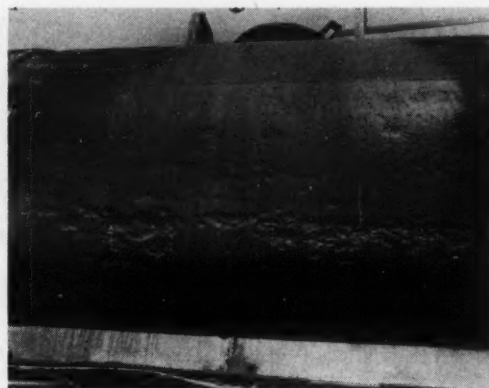
When inquiring check CP 4799 opposite last page

## CORROSION CONTROL

**HCl penetrates steel tank,  
 but rubber lining still  
 in perfect condition**

Striking example of the corrosion resistance of rubber linings

Recently when a tank trailer was brought into a shop for repairs it was found that HCl had eaten completely through one section of the heavy gage steel tank from the outside but had stopped when it reached the vessel's inner rubber lining. This is a striking example of the corrosion resistance of rubber linings, this lining still being in perfect condition after 15 years' service in the tank trailer, which has been used for transporting hydrochloric acid.

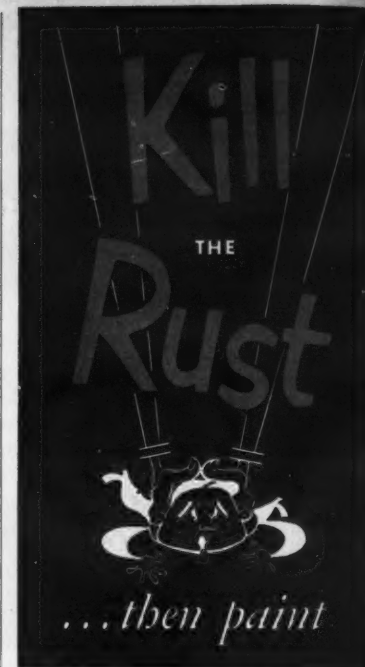


Although HCl has eaten completely through heavy gage metal tank, soft rubber lining is still in excellent condition after 15 years' service

Reason the steel tank had corroded severely in the center section is that the manhead was located here and the corrosion had resulted from spillage on the outside of the tank. In repairing tank, center section was cut out, and a replacement fabricated. Next, inside was sandblasted and a 3/16" soft rubber lining applied by Vulkalock process, thus joining the two-thirds of the old lining of the same material to the new. Process upon vulcanization joins rubber to steel with a bond strength of 300 to 500 psi.

When new center section was welded into place, steps were taken to prevent recurrence of corrosion from spillage on outside of tank. Original running board design was dropped in favor of a smooth surface. Outside surface of center section received three coats of neoprene and a tandem axle unit was added. Trailer, now back in service, is expected to last 15 years more or longer.

(Soft rubber lining used in vessel is product of



**OSPHO**

**CONQUEROR OF RUST**

saves hours of preparation time,  
 doubles paint job life

OSPHO stops rust action on any rusted surface. It's the perfect metal treatment for use *under* your regular maintenance paint. Save hours of preparation time—no sandblasting, no scraping, no flame-cleaning. Brush or spray OSPHO on; rust turns to hard gray iron phosphate. Your paint jobs last twice as long. So easy to use you don't even have to stir it. OSPHO is a *proven* product used and reused by hundreds of companies and institutions for all kinds of maintenance painting. Gallon covers a minimum of 500 square feet yet cost is only \$3.00 per gal. (in cases of 4), \$2.80 per gal. (in 10-gal. kegs), \$2.60 per gal. (in 50-gal. barrels). (F.O.B. Cleveland.) Order now—see with your own eyes how OSPHO kills rust.



**RUSTICIDE PRODUCTS CO.**  
 3125 Perkins Ave. • Cleveland 14, Ohio  
 Quality Maintenance Products Since 1917

When inquiring check CP 4800  
 opposite last page

CHEMICAL PROCESSING



B. F. Goodrich Co., Dept. CP, 448 S. Main St., Akron, Ohio . . . or for more information check CP 4801 on the convenient Reader Service slip which is located opposite last page.)

(Original lining was applied and present repairs made by Protective Coatings Div., Metalweld, Inc., Dept. CP, Scotts Lane & Abbottsford Ave., Philadelphia, Pa. . . . or for more information reader may simply check CP 4802 on the form which is located opposite last page.)

**Alloy resists fretting corrosion  
from heat and vibration . . .**

high tungsten metal suitable for temperatures up to 1000°F or higher .

**Uses:** For use in chemical valves, acid pump parts, and other equipment where resistance to heat, vibration, and abrasion is required.

**Features:** Alloy overcomes fretting and fretting corrosion at temperatures of 1000°F and higher.

**Description:** Hard-facing alloy has a high tungsten content which hardens the matrix, giving it improved resistance to heat and vibration. Alloy is available as a powder for application by spray-welding or as welding rod for application by torch. It can also be obtained in castings.

(Colmonoy No. 70 hard-facing alloy is product of Wall Colmonoy Corp., Dept. CP, 19345 John R St., Detroit 3, Mich. . . . or for more information check CP 4803 on form opposite last page.)



"Broderick, you're to be congratulated. . . We've been looking for a higher viscosity oil for some time. . ."



## Dependable the World Over!

Thousands of continuous hours without breakdown, without stoppage is not unusual with a LaBour pump.

With this unequalled record, it's no wonder that men, the world over, who specify equipment for corrosive liquids usually select LaBour pumps to handle their particular jobs.

LaBour pumps went to North Ireland to work for the W. J. Fraser Ltd. in its spin bath recovery plant. Distance made no difference to the designing engi-

neers of this plant for they knew they could depend on LaBour pumps for continuous service without interruption . . . and so can you.

For more than 30 years, in plant after plant having the toughest chemical jobs, LaBour pumps have been handling the operations smoothly and efficiently.

Take a tip from men in the know—specify the pump that gives them day-in, day-out service, LaBour . . . it's **DEPENDABLE THE WORLD OVER!**

# LABOUR



When inquiring check CP 4804 opposite last page



## TOO ATTRACTIVE TO DROP



CORRUGATED AND  
SOLID FIBRE BOXES • FOLDING CARTONS  
KRAFT PAPER AND SPECIALTIES  
KRAFT BAGS AND SACKS

*Damage claims can often be reduced without extra cost... simply by improving the appearance of your container. Handsomely printed Gaylord boxes can make your product seem "special"... encourage careful handling by truckers and warehousemen everywhere.*

*For a box to make your product more impressive... to assure "first-class" handling... call your nearby Gaylord office.*

GAYLORD CONTAINER CORPORATION • ST. LOUIS

DIVISION OF CROWN ZELLERBACH CORPORATION

When inquiring check CP 4805 opposite last page

## material handling



## handling 7500-pound loads on slippery floors

**... proved to be something of a problem until American Oak Leather Co. obtained small electric tractors — similar to large highway tractors. Result of new operation: one man now handles maximum loads with ease and safety**

**Problem:** American Oak Leather Company, Cincinnati, Ohio (now a division of Howes Leather Company, Inc.) was housed in a plant made up of two large multi-story buildings. These buildings were connected by a long enclosed ramp, having a rise of one-half of a floor level. Buildings' floors were of wood having a limited floor-load rating. Leather traveled from tanning pits in buildings' basements through stages of the tanning process.

Leather in process was moved from department to department on semi-live skids — dry material on an open skid and wet in skid boxes. Weights on open platforms ranged from 1500 to 4500 lb. Wet material weighed from 3500 to 7500 lb. Loads were commonly pulled by three or more men whose troubles were multiplied by sloppy floor conditions. Floors were constantly wet due to drippings from hides, consisting of water and an accumulation of

CHEMICAL PROCESSING





Tractor units handle 4500-lb load in semi-live skid

tanning liquors, grease, and such. Aisles were slippery or sticky depending on climatic conditions.

First move to solve these handling problems was use of large gasoline tractors. This proved satisfactory until units' weight began to buckle floors and complaints about gas fumes became frequent. Next move was to use motorized hand-trucks but maintenance costs became prohibitive because of corrosion.

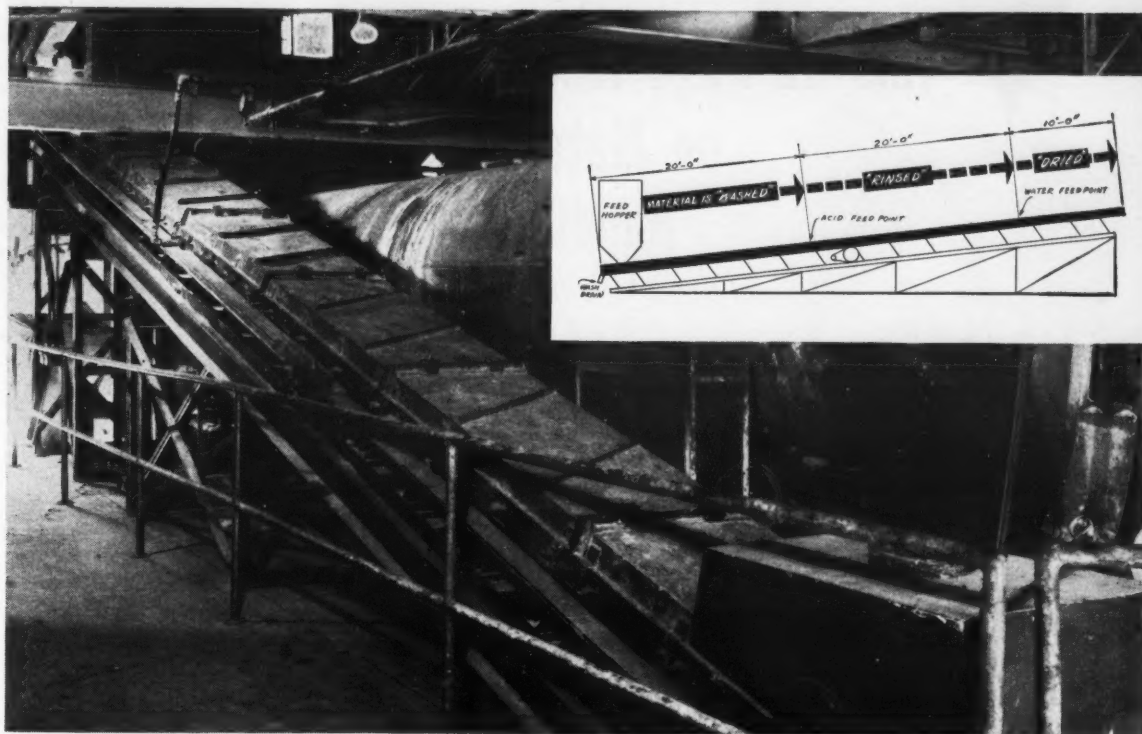
**Solution:** In 1948 an answer to the problem was found in a miniature electric tractor patterned after units which pull over-the-road trailers. At rear of tractor is small coupling which engages coupling on semi-live skid. Hydraulic-electric lift raises truck's platform three to four inches, making tractor-trailer unit.

Corrosion problem has been licked by water-tight construction and undercoating with special primer making thorough daily cleanings possible. Unit has twin drive wheels and can be stopped with handle in any position. Truck has a capacity of 4000-lb lift with 8000-lb trailing load.

When American Oak Leather was bought out by Howes Leather Company, Inc. of Boston, part of the facilities were carried over into American Oak Chrome Retan Division of Howes Leather.

(Please turn to next page)

## CARRIER does the "IMPOSSIBLE" for the biggest names in industry!



### "Dy-Dee Service" for ORE— Leaching, Rinsing, Drying!

**T**HE photo and diagram show you how ore is "washed-rinsed-and-dried"—in one continuous operation, for one of America's largest industries.

It used to be a three-step, batch process. First the material had to be leached in a big vat to reduce salt content. Then it was transferred to another tank for rinsing. Finally it was removed to another location for dewatering. It was a slow, cumbersome, expensive process.

Streamlining this operation was a cinch for Carrier engineers. In a matter of weeks they designed a 50' Natural-Frequency Conveyor to do all three jobs, continuously. As the material

moves onto the conveyor, a weak acid bath flowing down the pan leaches out the salt. Then it is rinsed with a water bath. Finally as it continues up the last 10' of the conveyor, it is dewatered by vibration plus gravity.

There's no fussing with batches, no spillage, no costly manpower. What's more, there's a big saving in floor space and processing time has been cut by approximately two-thirds.

Agitation of a solid and a fluid, in a controlled continuous contact and separation cycle, is a natural for Carrier, who pioneered and specialize *exclusively* in Natural-Frequency Vibrating Equipment. How about your operation—aren't there some spots where heat-treating, quenching, cleaning or other processes can be combined? Tell us about them and let us see what we can work out for you.

## CARRIER NATURAL-FREQUENCY CONVEYORS

Carrier Conveyor Corporation  
209 North Jackson Street, Louisville 2, Kentucky

When inquiring check CP 4806 opposite last page

**FREE!** to executives ... engineers ...  
supervisors

## This 32 Page Idea Book on Materials Handling

*will spark your thinking*

Need a system to lower ¾-ton newsprint rolls ... or to handle sheet steel ... or bulk chemicals, coal, textiles, grain, foundry materials—almost anything at all?

Whatever you have to move ... and whatever the direction—up, down, or horizontal—you'll find lots of answers in this factual, fully-illustrated book. It's crammed with photos, engineering drawings, basic information about a broad range of materials handling problems.

You'll see, for example, how G-W developed a "ferris wheel" system that moves both 1300-lb. beams of rayon and 900-lb. box trucks up or down 6 stories *completely automatically* for annual savings of \$25,000!

You'll read of the can manufacturer who needed a system which would automatically feed, lower and discharge 2500-lb. bundles of sheet steel—and installed a G-W system which resulted in 87% savings in handling time.

But these cases are just two among hundreds which G-W has solved.

If your problem is materials movement, write today for this big, free Idea Book that tells exactly how G-W's 142 years of engineering and fabrication experience can serve you.

### GIFFORD-WOOD Co.

Since 1814 • Hudson, N. Y.

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When inquiring check CP 4807 opposite last page

## MATERIAL HANDLING

### Miniature Electric Tractor

(Continued from preceding page)

**Results:** Company now does handling jobs with one man where three or more were previously needed. Consequently, handling costs have been diminished while volume per shift has increased considerably. Maintenance costs have been negligible considering conditions under which the trucks have operated.

Though these trucks were initially put in service six and eight years ago, they are still working under approximately the same conditions.

(KTL Tractor is product of Lift Trucks, Inc., Dept. CP, 2425 Spring Grove Ave., Cincinnati 14, Ohio. Check CP 4808 opposite last page.)

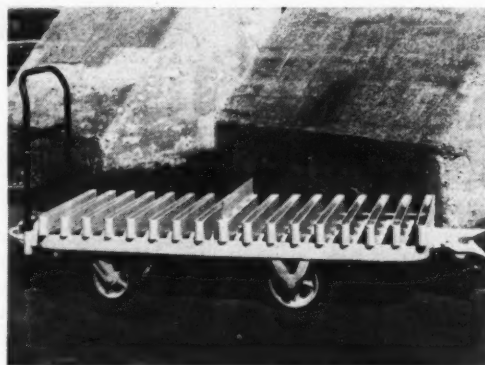
### Permits material handling without skids ...

material, resting on steel bars, is lifted directly by truck forks

**Uses:** Palletless handling of materials stored in boxes, drums or similar containers.

**Features:** Material is removed from trailer by fork truck, utilizing multiple fork attachment, also available from the manufacturer. Fork attachment is also available with push-off device.

**Description:** Standard wood or steel deck is replaced by 4 x 4½" bar stock, rounded on each



Standard deck has been replaced by steel bars

end and welded to frame on 2" centers. Unit is similar to standard caster steer trailer with the exception of deck construction. Fitted with self-couplers for "trackless train" operation, truck has capacity of two tons. Deck is 30 x 84" — height is 14¾".

(Palletless trailer is product of Mercury Manufacturing Co., Dept. CP, 4044 S. Halsted St., Chicago 9, Ill. Check CP 4809 opposite last page.)



### LOW COST AIR VIBRATORS GUARANTEE STEADY MATERIAL FLOW OR SETTLE CONCRETE MIXES

Powerful hammer-like blows delivered by CLEVELAND Type "F" air vibrators prevent arching-over and plugging in bins, hoppers and chutes. These dependable units have been designed for use on all types of hoppers and bins handling sand, cement, cinders and all other granular materials.



Type "LSRR"

LSRR air vibrators utilize cast steel male wedge type mounting bracket which fits the female bracket that is standard equipment on most covered hopper railroad cars. In addition, female brackets can be furnished for attachment to bins, concrete forms, chutes, etc., and a single LSRR vibrator can be moved from one installation to another to handle several different applications.

New vibrators featuring a portability and rapid, easy attachment to wooden studs or metal structural members are now available. These units are recommended for use on concrete forms, hoppers, bins, dump trucks, etc. to settle or shake-out their contents.

These CLEVELAND air vibrators and many others are illustrated and described in the new CLEVELAND VIBRATOR catalog. Write today for your copy.



2706 Clinton Avenue • Cleveland 13, Ohio

When inquiring check CP 4810  
opposite last page

CHEMICAL PROCESSING

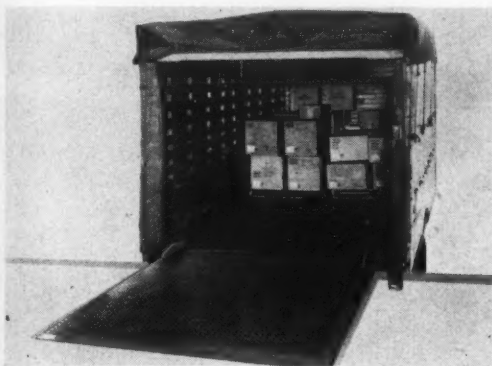


**Adjusts for springing of truck during load transfer**

**Uses:** Provides safe, easy movement of handling equipment between truck bed and loading dock.

**Features:** Ramp automatically compensates for spring deflection of truck bed during load transfer. Deck is initially raised to clear floor of incoming truck. After truck is positioned, deck is lowered until float arms rest on truck bed. Floating action then automatically compensates for truck's spring action.

**Description:** Unit, of 10,000-lb capacity, is six feet wide, with available lengths of 5, 6, 7, and



Unit automatically compensates for truck's springing action during load transfer

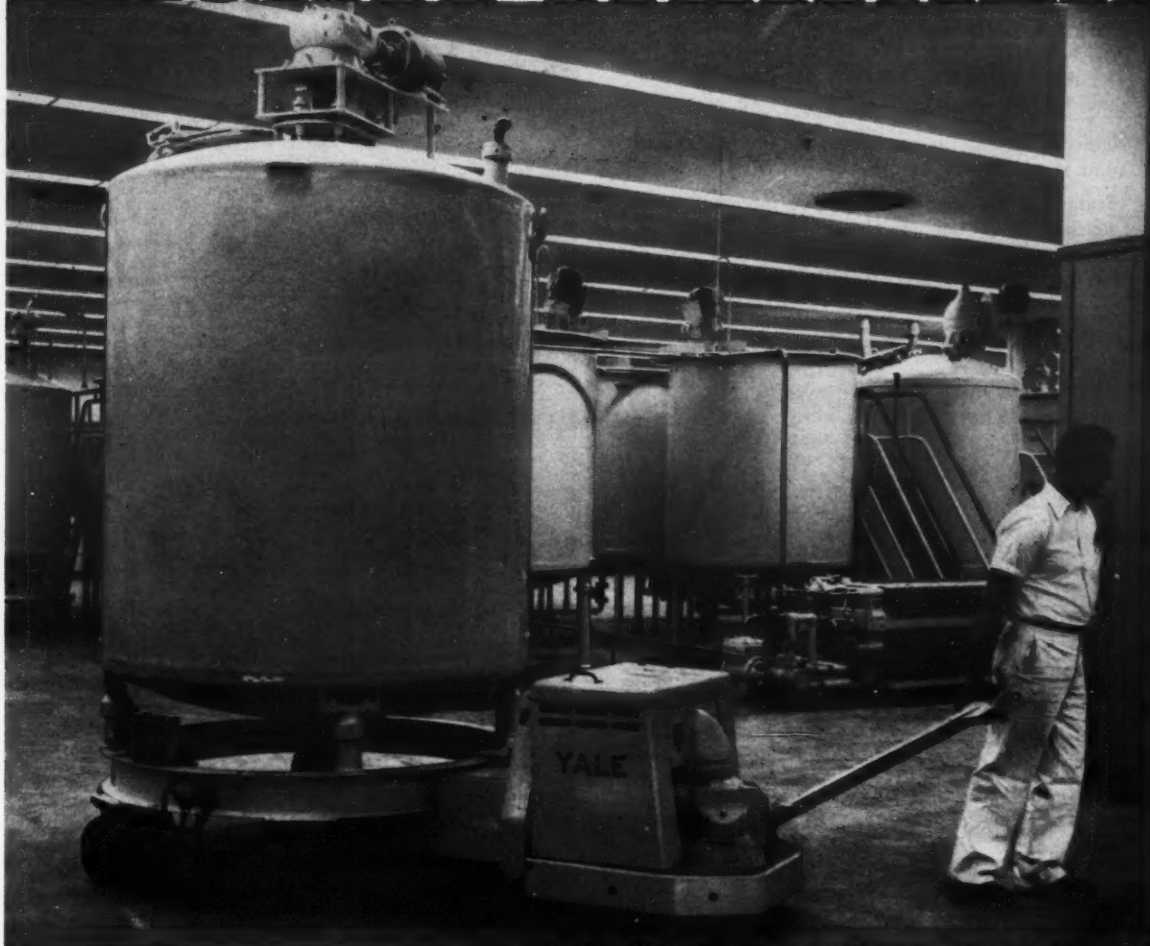
10 feet. Unit can be installed recessed in dock, partially recessed, or in front of dock, depending on specific requirements.

(Dock is manufactured by Rowe Methods, Inc., Dept. CP, 2534 Detroit Ave., Cleveland 13, Ohio . . . or for more information check CP 4811 on form opposite last page.)



"Foreign?"

# MIIGHTY PARTNIER



With a Yale Worksaver, moving a full 1,000-gal. tank is a one-man job.

## HERE'S WHY NEW YALE WORKSAVERS MOVE CHEMICALS EASILY AND SAFELY

Yale Worksavers handle loads up to 7,500 lbs. with maximum safety for the operator as well as the load. Their compact design and rugged construction provide the necessary load stability that makes Yale Worksavers ideal for use almost anywhere in chemical plants—over low-load floors, on freight elevators and in cramped quarters where standard size lift trucks cannot operate. Yet, Yale Worksavers have all the big-truck features you need, such

as hydraulic lifting, easy steering and power travel.

To meet different materials handling needs of chemical processing plants, Yale offers Worksavers in pallet, platform, tractor and high-lift fork models. Whatever Yale Worksaver you select . . . wherever you use it, you will step up production and keep shipments rolling. For complete information about Yale Worksavers, write the Yale & Towne Mfg. Co., Philadelphia 15, Pa., Dept. 124.

# YALE<sup>\*</sup> INDUSTRIAL LIFT TRUCKS AND HOISTS

\*REG. U.S. PAT. OFF.

Gas, Electric, Diesel & LP-Gas Industrial Trucks • Worksavers • Warehouseurs • Hand Trucks • Hand and Electric Hoists

When inquiring check CP 4812 opposite last page

## MATERIAL HANDLING

### Truck uses three attachments — fork lift, platform, hopper . . .

versatile unit is available in three- or four-wheeled model

**Uses:** Useful in smaller operations where one unit must serve a number of functions.

**Features:** Provided with three interchangeable attachments — hopper, platform and fork lift — for one standard chassis, truck can load, lift or haul all types of materials with one basic unit.



Three-wheeled truck lifts one-half ton to six feet

**Description:** Unit is available in two models—three-wheeled and, for heavier duty, four-wheeled. Load carrying capacities of the interchangeable attachments are: gravity dump hopper body — 10 and 15 cu ft; tilting platform body — 1500 and 2000 lb; hydraulic fork lift — 1000 and 1500 lb to 6 and 7' maximum height.

Units are built on welded, one-piece frame. Brakes are of internal expanding type. Trucks are equipped with full power forward and reverse through double-acting disc clutch and an automotive type differential.




Larger unit (left) carries up to 15 cu ft of material in hopper body. Platform body (right) is easily dismountable — handles  $\frac{3}{4}$  ton on smaller basic unit

PS-2

COVERED HOPPER

the

k





WEATHERTIGHT HATCH  
AND HATCH COVER

The hatch consists of one piece of one-piece pressed steel, welded to an iron flange. With an internal diameter of 2'-6" the covering flange 2 1/2" above the rail surface. Note how the upper lip of the covering is curved down to help exclude weather and dirt. The hatch cover, also of one-piece pressed steel, hinges to the flange when it fits on the rail between the covering board and the rail edge. It does not touch the covering board. The hatch cover fits tightly into the curved lip of the covering, and makes a tight seal on the entire opening circumference. Hatch cover locking device is positive, simple and easy to operate.



BUILT TO SERVE BEST ON THE

GREAT AMERICAN RAILWAY

System

BY PULLMAN-STANDARD

Built b  
field, th  
maxim

For a  
the PS-  
exclud  
are des  
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smooth  
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circular  
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of the w



# keeps bulk shipments CLEAN and DRY

**faster loading and unloading, too,  
mean important time and money savings  
for shippers and consignees**

Built by Pullman-Standard, leader in the carbuilding field, the PS-2 Covered Hopper Car is standardized for maximum service to shipper, consignee and railroad.

For any dry lading capable of being shipped in bulk the PS-2 offers assurance that dirt and weather will be excluded. Patented Pullman-Standard circular hatches are designed so that driven rain cannot build up against the coaming and seep up and under the hatch cover. The lip of the coaming is rolled downward as an added weather safeguard. The hatch cover makes firm and smooth sealing contact with the entire circumference of the coaming rim. Special, easy-to-operate latch assemblies hold the covers tightly closed. The properly located circular hatches permit rapid loading and unloading with hose or wand, while the Pullman-Standard design of hoppers, hopper chutes and hopper doors allows fast unloading directly into take-away devices. Hopper doors operate easily, but close securely and positively, permitting no loss through leakage.

The PS-2 Covered Hopper Car is built with worker safety in mind. Hatch cover latch assemblies are located well away from the roof edge. Hatch covers hinge so that opening and closing are parallel to the length of the car: the cover of the open hatch lies on the roof, out of the working area. Workmen perform most operations

from the security of the nonslip running board and it is unnecessary for men to walk on or over opened hatch covers or approach the edge of the roof.

The PS-2 is now in service in two sizes: two hopper, 2003 cu. ft. with 8 loading hatches and 4 unloading doors, and three hopper, 2893 cu. ft. with 10 loading hatches and 6 unloading doors. In either size, every PS-2 is built with the precision craftsmanship that has helped Pullman-Standard become the leader in the carbuilding field. And every PS-2 is thoroughly water tested to make certain that it is completely leak proof.

Standardized freight cars, the PS-1 Box Car, PS-2 Covered Hopper, PS-3 Open Hopper and PS-4 all-purpose Flat Car, are built only by Pullman-Standard. And standardized freight cars are designed, tested and mass produced with the precisely engineered craftsmanship that has made them outstanding in economy, dependability and performance. Shipper, consignee and railroad all benefit through specifying Pullman-Standard Standardized Freight Cars.

More than 9500 PS-2 Covered Hopper Cars have been put into service or ordered by 46 service and shipper-conscious railroads. To learn how the PS-2 could handle your bulk shipments as it does hundreds of materials, write Pullman-Standard.

## PULLMAN-STANDARD

**CAR MANUFACTURING COMPANY**  
SUBSIDIARY OF PULLMAN INCORPORATED

73 EAST ADAMS STREET, CHICAGO 3, ILLINOIS  
BIRMINGHAM, PITTSBURGH, NEW YORK, SAN FRANCISCO, WASHINGTON

Full loads increase unit's gradability as 75 percent of loaded weight is carried over front drive tires where traction is needed.

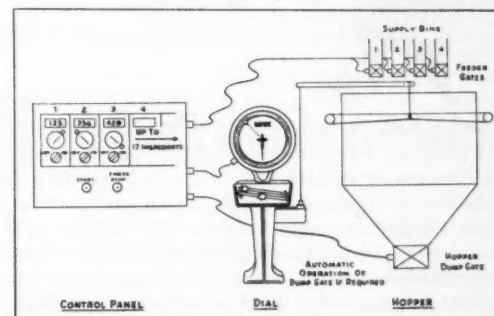
(Models S-10 and R-15 Moto-Bugs are manufactured by Kwik-Mix Co., subsidiary of Koehring Co., Dept. CP, Port Washington, Wis. . . . or check CP 4814 on form opposite last page.)

### **Will batch up to 17 separate materials automatically**

**Uses:** Unit provides automatic control to proportion various ingredients by weight in mixing or batching operations. Equipment will control mixtures of up to 17 ingredients.

**Features:** All electronic components are assembled on plug-in units. Magnetic amplifiers are used in final stage.

**Description:** Batching operation is completely automatic. Assume that a batch is desired to contain three ingredients: 125-lb of ingredient one; 231-lb of ingredient two; and 72-lb of ingredient 3. Operator sets potentiometer number one by means



Control system provides automatic batching of up to 17 ingredients

of small crank so that figure 125 appears on indicator. He then sets potentiometer number two to 236, or 231-lb more than the first one. Potentiometer number three is set at 428.

Potentiometer number one is placed in circuit and cut-off coil on dial head assumes position of 125-lb. Ingredient one starts to flow into hopper. When 125-lb are reached feed gate closes.

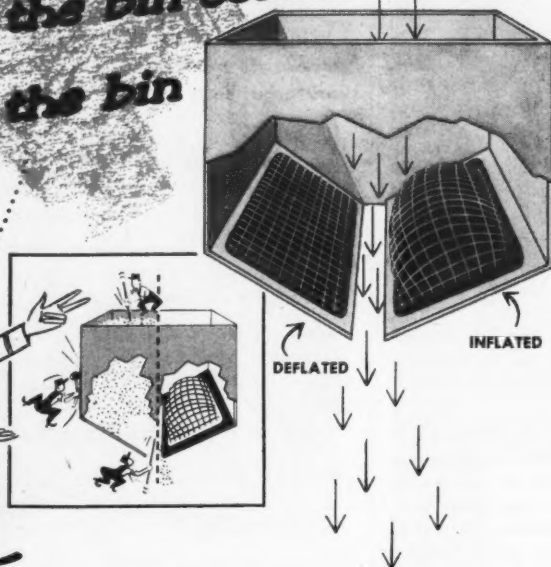
Cut-off coil assumes position on dial head at 336-lb. Ingredient two starts to flow until 231-lb have been fed into hopper. Gate two closes.

Operation continues until complete batch is in weigh hopper. Hopper dump gate then opens and completed batch flows on to next step in cycle.

(Batchmaster control system is product of Howe Scale Co., Dept. CP, Rutland, Vt. . . . or for more information check CP 4815 opposite last page.)

When inquiring check CP 4813 opposite last page

# PneuBin's principle of Positive Displacement moves the bin contents ...not the bin



**P**ulsating neoprene panels inside the bin are PneuBin's secret weapon against bin flow bottlenecks. The PneuBin unit consists of steelbacked, neoprene, pulsating panels mounted on the inside wall of your present bins . . . and air controls to regulate the panels' action. By the pneumatic inflation and deflation of the PneuBin panels, the bin contents are positively displaced to insure free flow. After the panels have deflated, the air control unit (operating off the regular plant air supply) starts another cycle of inflation and deflation. The process continues *automatically* at whatever frequency is set on the air controller (this frequency is adjustable).

Because the neoprene diaphragm is resistant to oils and most chemicals and is also thick and tough enough to withstand severe abrasive service, PneuBin is applicable to most any bin flow problem.

Sizes: PneuBin panels are available in ten standard sizes from 4" x 12" to 24" x 72". Special sizes can be made if required in quantity.

Send for "Flow Stoppage Report" and free literature. PneuBin engineers will gladly make recommendations, with no obligation on your part.

## GEROTOR

### MAY CORPORATION



When inquiring check CP 4816 opposite last page

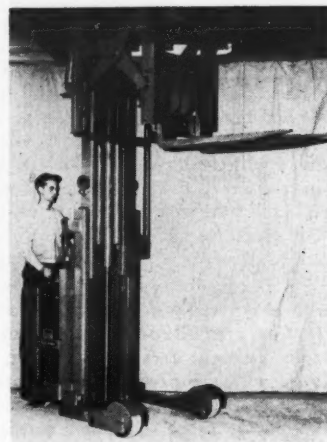
## MATERIAL HANDLING

**Used balanced design  
with small base  
and high lift . . .**

truck handles 3000-lb loads  
from six-foot aisles

**Uses:** Fork truck handles, stacks, or tiers palletized material where floor space is a major consideration.

**Features:** Telescoping form frame and balanced design permit operation in six-foot aisles.



Balanced design and telescoping forks permit operation in six-foot aisles

**Description:** Unit is available in 2000- or 3000-lb capacities. Power unit has thermal control on lift motor to eliminate overheating. Small-space operation is permitted by 36-inch (overall) length and offset drive wheel with 200° turning arc.

(Reach-fork Truck is manufactured by The Raymond Corporation, Dept. CP, Greene, N. Y. . . . or for more information check CP 4817 on form which is located opposite last page.)

Your guide . . . to more material handling ideas and equipment is the alphabetical product directory beginning on page 225 in this issue

## PALMER-SHILE

# Materials

## HANDLING EQUIPMENT

Engineered and Built  
to meet your needs

### LIFTS OPEN and CLOSED DRUMS

**Vertical DRUM LIFTER**  
Save valuable plant space with this improved Vertical Drum Lifter. Handled either by crane or hoist, and used where ceilings are high or low. Sure-hold safety-grip is one of its important features. All steel welded construction.

Item C-1258  
\$46.50

### PICKS UP BARREL, BOX OR CONTAINER

**BARREL and BOX GRAB**  
Item NS-288 (2000 lb. capacity)  
\$66.20

From 40" diameter to small nail keg. Available in 1000 and 2000 lb. capacity. Toggle principle design. Rugged construction of welded steel chain with tongs of heavy bar stock. Weight app. 35 lbs.

**BARRELS WEIGHING UP TO 1000 LBS.  
HANDLED WITH EASE BY A**

**BARREL TRUCK**  
loads automatically

Loads from a row as easily as when barrel stands alone. Only 24" wide, permitting passage thru doors or down aisles too narrow for many trucks. All welded steel construction. Weight app. 85 lbs.

Item S-911-M \$40.55  
(metal wheels)

Item S-911-R \$46.60  
(rubber wheels)

Item S-911-P \$54.45  
(pneumatic rubber wheels)

Prices F.O.B. Detroit Subject to change without notice

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**Palmer-Shile Co.**  
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When inquiring check CP 4818 opposite last page

CHEMICAL PROCESSING

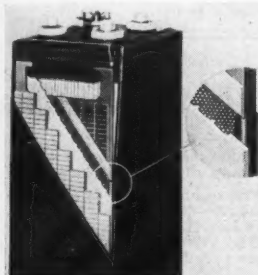


## MATERIAL HANDLING

### **Vinyl and polyethylene provide plate insulation**

Insulated with horizontally- and vertically-wrapped retainers as well as grooved, microporous rubber separators, batteries are designed for use on fork trucks or other mobile power units.

Vitrex and perforated polyvinyl chloride retainers, wrapped and fastened, a polyethylene insulat-



Positive plates in cell are insulated with vinyl-wrapped retainers, polyethylene strip, and rubber separator

ing strip, and grooved rubber separator provide positive plate insulation.

(Flat plate batteries are products of Dept. PC, Exide Industrial Div., The Electric Storage Battery Company, Dept. CP, Box 8109, Philadelphia 1, Pa. Check CP 4819 on form opposite last page.)

### **Complete descriptions of belts, trippers**

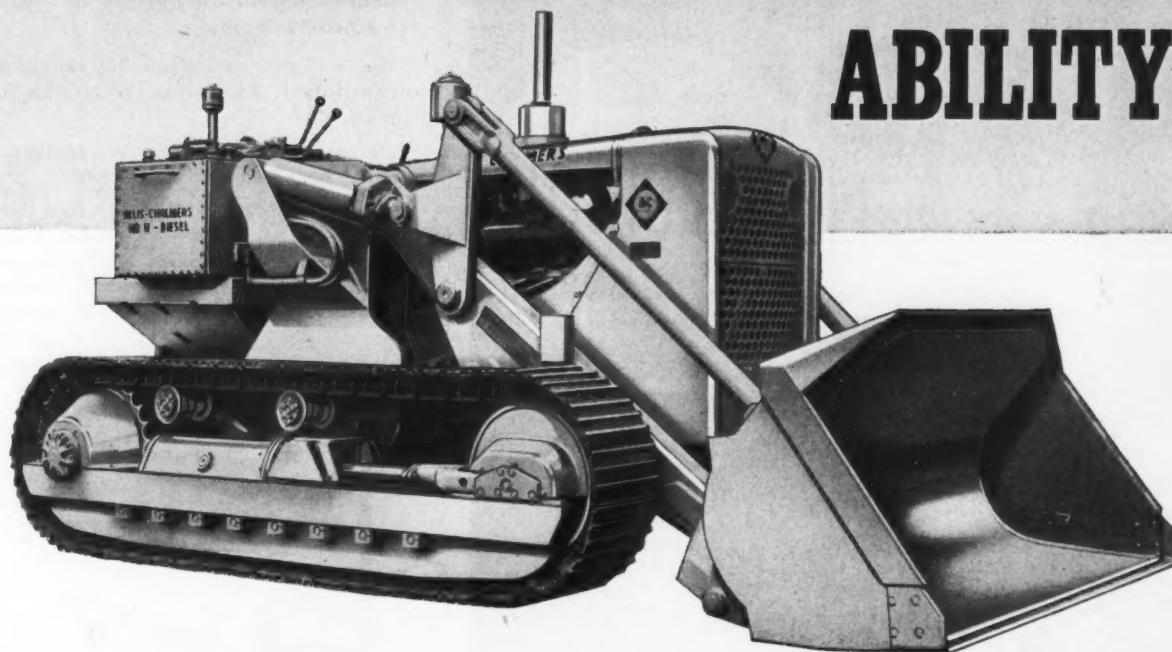
Printed in two colors, 16-page bulletin pictures all types of idlers, supports, trippers, and other belt conveyor equipment. Special attention is given to discharge spouts and grippers.

Bul 355 is issued by Stephens-Adamson Mfg. Co., Dept. CP, Aurora, Ill. Specify CP 4820 opposite last page.

For more information on product at right, specify CP 4821 ... see information request blank opposite last page.



# NEW MATERIAL-HANDLING ABILITY



2 1/4-yd Standard Bucket  
3 1/4-yd Light-Materials Bucket  
105 net engine hp  
32,000 lb  
11-ft, 7-in. dump height

## with the **ALLIS-CHALMERS HD-11G TRACTOR SHOVEL**

**NEW POWER** is provided by the modern, 105-hp Allis-Chalmers diesel. Tornado turbulence and "follow-through" combustion mean cleaner burning and more power from fuel, as well as smoother engine performance and extra long engine life. Added power pays off in extra crowding and loading ability, fast work cycles.

**NEW CAPACITY** — Big 2 1/4-yd standard bucket is streamlined to roll in large loads more easily. Improved design cuts spillage, clean dumping saves time and effort shaking out loads. Optional 2 1/4-yd tip-back bucket rolls back 25 degrees at ground level, handles bigger loads of loose material.

**NEW STABILITY** — Extra-long track — with almost 9 ft of track on the ground — plus 8 truck wheels on each side and 32,000 lb of weight, give the HD-11G unusual stability, plenty of traction.

**NEW-TYPE HYDRAULIC SYSTEM** is simpler, safer, easier to maintain. Tank has fewer external fittings. Magnetic filters and suction-line screens protect entire system. Hydraulic pump offers fast action, long life.

**NEW OPERATOR CONVENIENCE** — The HD-11G features easily controlled, accurate bucket action; reduced lever pull with new-type clutch; full vision; roomy platform; foam rubber seat; 60-gal fuel tank.

**NEW DEPENDABILITY AND SERVICING EASE** result from such features as heavy-duty truck wheels and idlers; new, long-life track; new-type, long-lasting, ceramic master clutch lining; unit construction's quick disassembly and assembly of major parts; 1,000-hour lubrication intervals for roller bearing truck wheels, support rollers and idlers.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

Stop in soon and see the  
production-boosting HD-11G  
at your Allis-Chalmers dealer's.

# ALLIS-CHALMERS





**STRAIGHT UP**  
...if you say so

**POWER-CURVE CONVEYOR CO.**  
2125 SOUTH JASON STREET • DENVER 20, COLORADO

When inquiring check CP 4822 opposite last page

## MATERIAL HANDLING

**Is of tubular steel construction —  
handles standard pallets  
of 30 to 72 inches**

**Uses:** Truck is designed for manual handling of palletized material in areas with relatively smooth floors.

**Features:** Unit, of one-ton capacity, utilizes tubular steel frame to save weight.

**Description:** Truck lifts pallet four inches from ground with nine foot-pedal strokes. Pallet lowering is positively controlled to provide cushioning action when handling fragile loads. Steering handle is balanced and returns to vertical position when



Balanced steering handle returns to vertical position when released, remaining free of foot pedal regardless of position or angle of turn

released. It remains free of elevating foot pedal in any position or angle of turn. Hydraulic lifting ram is chrome-plated. Pump is equipped with piston rings instead of packing. Hand truck is equipped with overload relief valve, preventing damage in cases of excessive loading.

Truck is available in sizes to handle standard pallets of 30 to 72 inches in six-inch increments.

(Hand truck is manufactured by Yale Materials Handling Div., Yale & Towne Mfg. Co., Dept. CP, 11,000 Roosevelt Blvd., Philadelphia 15, Pa. Check CP 4823 on form opposite last page.)

### For heavy loads of bar stock

Illustrated folder describes and shows tying and storing with portable bar racks. Use of automatic tongs with overhead crane is also illustrated.

"Bar Racks" is issued by Palmer-Shile Co., Dept. CP, 16016 Fullerton, Detroit 27, Mich. When inquiring specify CP 4824 opposite last page.

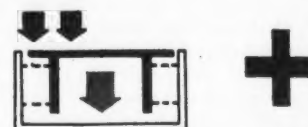
## Batch or continuous

**UNITIZED  
WEIGHING**

**easily installed...lower in cost**

### UNI-FORCE PLATFORM

...applies only vertical force components ... assures full accuracy despite load placement or pile-up. No springs, knife edges or levers. Immune to side thrust.



### WEIGHT TRANSDUCER

W-C Electrical Transducer can offer the broadest net weight output range ... correspondingly higher accuracy.

W-C Pneumatic Transducer gives force-balance dependability ... with independent tare adjustment. Unaffected by vibration. High sensitivity. Accuracy to 0.25% of range.



### INSTRUMENTATION

Remote indication or fully automatic control of batch or continuous weighing ... any material ... any vessel or conveyor.



Write for descriptive literature.



**WEIGHING and Control COMPONENTS, Inc.**

64-A Fulmor Ave., Halthers, Pa.

When inquiring check CP 4825 opposite last page

CHEMICAL PROCESSING



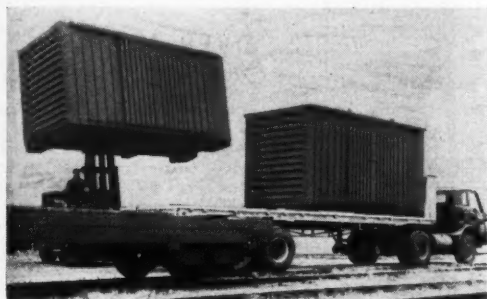
## Serves as freight car, gondola, or tanker

Four-wheeled units, half the weight  
of normal freight cars, convert  
to any service

A completely new design of railroad car, an "all-in-one" basic unit, is low-cost, interchangeable, light-weight car of superior riding qualities. Equipped with standard couplers, its weight and cost are about one-half that of standard freight cars with comparable equipment.

Features of four-wheel, 35-foot long car include fixed axles, air-cushioned suspension, roller bearings and self-cleaning floor.

With a capacity of 70,000 lb (more than three times its own weight) unit has passenger car riding qual-



Individual containers can be handled between flatcars and trailer trucks by crane or fork lift truck

ities — providing added protection for lading. Car's reduced weight is result of design rather than use of lightweight metals.

Basic design lends itself to boxcar, container-hopper, gondola, tank car, hopper car, and "piggy-back" service. Versatility is result of interchange of removable superstructures on car's platform. Unit's manufacturer will supply containers, tanks, gondolas, hoppers, and other superstructures so that railroads may make them readily available at freight terminals.

Boxcar consists of two 17-foot containers or four 8-foot containers on basic flatcar. Containers can be lifted off cars and on to waiting trailer-trucks by crane or fork lift truck. Easy loading and unloading, as well as convertible feature, is expected to cut dunnage time of cars in terminals and sidings.

(Adapto freight car is product of American Car and Foundry Div., ACF Industries, Inc., Dept. CP, 30 Church St., New York 8, N. Y. . . or for more information reader may simply check CP 4826 on the convenient Reader Service slip which is located on form opposite last page.)

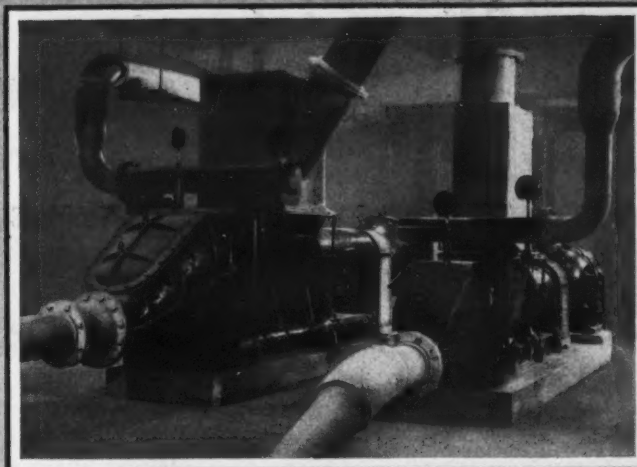
## What's the Best Way to move dry, pulverized materials

## From HERE to THERE?

Unquestionably, the best way is the way that keeps production highest and costs lowest in any plant where bulk-material handling is a basic production factor.

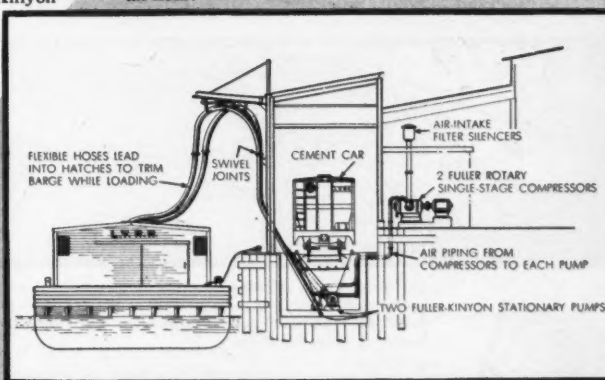
"Here," may be cars, trucks, ships, barges, grinding mills or storage—"there," may be packer bins, process, cars, trucks, ships or barges. If your operation involves loading, handling, unloading or all three, the Fuller-Kinyon System assures that full capacity will be maintained over the maximum conveying distance. Air does the work—safely, cleanly, efficiently. And it's versatile—you can use Fuller-Kinyon anywhere—a pipeline can be run, and depending upon your requirements, it is available for remote or automatically controlled operation.

If you are presently conveying dry, pulverized materials into, through, or out of your plant, get the full story on Fuller-Kinyon—harnessing air to move materials. It costs you nothing and may well pay you plenty in terms of higher, sustained production at reduced cost. Write today for Bulletin FK-26A.



Fuller-Kinyon Pumps installed in a cement plant conveying finished Portland Cement and cement raw materials.

Fuller-Kinyon system transferring Portland cement from hopper-bottom cars to barges at rate of 1000 barrels an hour.



# Fuller

pioneers in harnessing AIR

## FULLER COMPANY

136 Bridge St., Catasauqua, Pa.

A SUBSIDIARY OF GENERAL AMERICAN TRANSPORTATION CORP.

Chicago • San Francisco • Los Angeles • Seattle • Kansas City • Birmingham

P-161  
3018

When inquiring check CP 4827 opposite last page

# Ask Standard

## how to cut costs with conveyors



Live roller and gravity roller system handles 55 gal. drums from storage through filling and weighing operations to shipping.

### No manpower needed to keep heavy drums moving

STANDARD conveyor systems keep heavy, bulky commodities moving with minimum manpower and time loss. Systems can be job-tailored to any specific materials handling problem — to meet almost any needs.

With more than 50 years of experience in conveyor application, Standard engineers are qualified and ready to help solve your handling

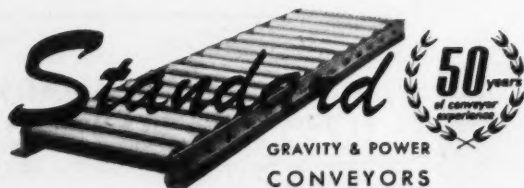
problems. Standard builds permanent or portable systems and units, using roller, belt, slat, chain, push-bar or sectional conveyors — power or gravity; also spiral chutes and pneumatic tube systems. Consult STANDARD CONVEYOR COMPANY General Offices: North St. Paul 9, Minnesota. Sales and Service in principal cities.



Cut costs, too, in shipping and receiving operations with Standard portable units, either powered or gravity operated. (Left) HANDIBELT portable powered conveyor unit (right) LITEWATE Sectional Roller Conveyor.



Call the Standard engineer listed in your classified phone book, or write direct for Bulletin 309 — address Dept P-4.



Sales and Service in Principal Cities.

When inquiring check CP 4828 opposite last page

### MATERIAL HANDLING

#### Pictures potash handling

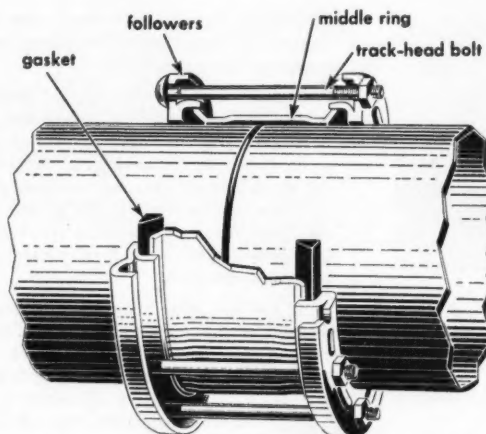
Featuring nine pictures in its four pages, field report covers dragline aspects of handling potash at Carlsbad, New Mexico. Plan drawings and photographs supplement description of several handling systems.

Field Report 227 is issued by Sauerman Bros., Inc., Dept. A-7-CP, 620 S. 28th Ave., Bellwood, Ill. Specify CP 4829 opposite last page.

#### Joined by simple couplings — resists action of abrasive materials . . .

casting process retains radial crystal arrangement — increases wear resistance

Uses: Line of pipe, sleeve couplings, and piping accessories is designed for hydraulic or pneumatic material handling systems.



Sleeve coupling makes flexible seal, permitting 4° angle of deflection per connection

Features: Metal obtains texture and hardness from method of casting and basic composition. Chrome-iron alloy ranges in hardness from 280 to 340 Brinell and is largely free from holes, slag, and sand inclusions. Casting process increases wear-resistance by retaining radial crystal arrangement.

Description: Pipe is available in sizes from 4 to 12" ID and in lengths up to 16 feet. Odd lengths may be cut from stock in field or can be ordered to exact length in 1/4-inch increments.

Standard sleeve coupling permits simple pipe connection. As bolts are drawn up, gasket pressure produces tight yet flexible seal, permitting 4° angle of deflection per connection. Connections simplify alignment and make it relatively easy to rotate

Specify Low Cost—Long Life  
**DEPENDABLE**



**CASTERS  
&  
WHEELS**

by

**DARNELL**

for chemical plants

### ...OVER 4000 TYPES of CASTERS & WHEELS

All types of rubber treads - soft, medium and hard - for smooth operation on all kinds of floors. Featuring Neoprene rubber treads - resistant to steam, water, oxidation, oils and waxes and unaffected by most chemicals - expertly compounded to Darnell standards in our own rubber factory.

1. LONGER EQUIPMENT LIFE
2. GREATER FLOOR PROTECTION
3. EASY EQUIPMENT MOVABILITY

All Darnell Casters, whether steel or rubber tread, are available with various top plates, stems and fittings for any type of application. Or, Darnell engineers will gladly design a special type caster for your own individual equipment. Demand Darnell for Dependability.

Get your  
**FREE COPY today!**

This little book  
saves time and money

**DARNELL CORPORATION**  
LTD.

DOWNEY (LOS ANGELES COUNTY) CALIFORNIA  
60 WALKER STREET, NEW YORK 13, NEW YORK  
36 NORTH CLINTON STREET, CHICAGO 6, ILLINOIS

When inquiring check CP 4830  
opposite last page

CHEMICAL PROCESSING



## MATERIAL HANDLING

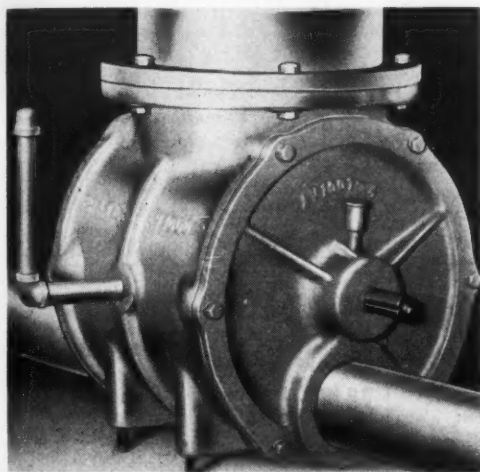
pipe to obtain uniform distribution of wear.

(Ashcolite pipe and fittings are manufactured by The Allen-Sherman-Hoff Co., Dept. CP, 259 E. Lancaster Ave., Wynnewood, Pa. . . or for more information check CP 4831 opposite last page.)

### **Either high or low pressure OK with redesigned feeder**

**Uses:** Unit is designed to feed powdered or granular product into pneumatic conveying lines.

**Features:** Unit functions as a working seal, sustaining differential pressures in system. Feeder seals off air at bottom discharge of bag filters, spray dryers, or dust collectors.



Unit feeds most types of powdered or granular products into pneumatic conveying lines

**Description:** Feeder, of cast iron construction, has closed pocket-type rotor. Bearings have sealed-in permanent lubrication.

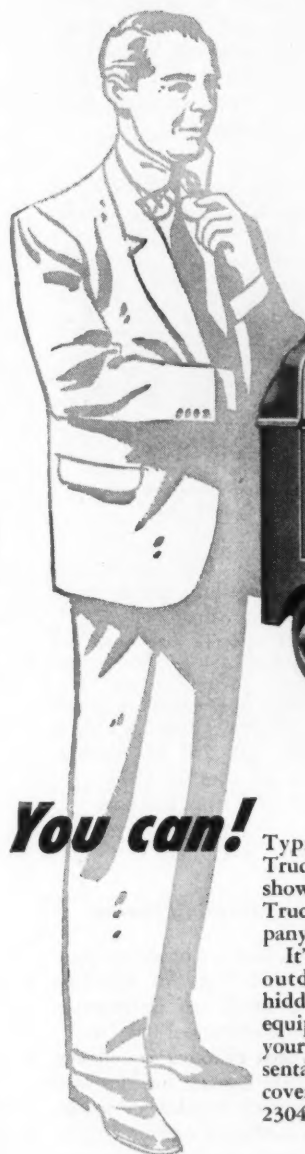
(Airlock feeder is manufactured by Prater Pulverizer Co., Dept. CP, 1517 S. 55th Court, Chicago, Ill. Check CP 4832 on form opposite last page.)

### **Pictures power wheelbarrow and attachments**

Booklet of eight pages illustrates basic unit of power wheelbarrow and possible attachments. Applications are pictured using interchangeable attachments which are gravity dump hopper, tilting platform, and hydraulic fork lift.

Bul KM429 "Moto-Bug" is issued by Kwik-Mix Company, Dept. CP, Port Washington, Wisconsin. Specify CP 4833 on form opposite last page.

## **Can I afford a Towmotor?**



### **You can!**

Typical savings produced by Towmotor Fork Lift Trucks are revealed in recent Certified Job Studies which show that: For one company, one Towmotor Fork Lift Truck paid for itself in 10 months. For another company, six Towmotor units saved \$50,000 in a single year.

It's an amazing fact that most companies now using outdated materials handling methods are, through hidden costs, already paying the price of Towmotor equipment. To discover how you can save money on your materials handling, call your Towmotor representative today! . . . or write for Certified Job Studies covering your industry. TOWMOTOR CORPORATION, Div. 2304, 1226 E. 152nd St., Cleveland 10, Ohio.

Read how a Chemical Manufacturing Company saved \$50,000 a year on materials handling.

Ask for Job Study #130

THERE'S ONLY ONE FORK LIFT TRUCK CALLED TOWMOTOR

**America's best engineered fork lift truck**

See the TOWMOTOR EXHIBIT

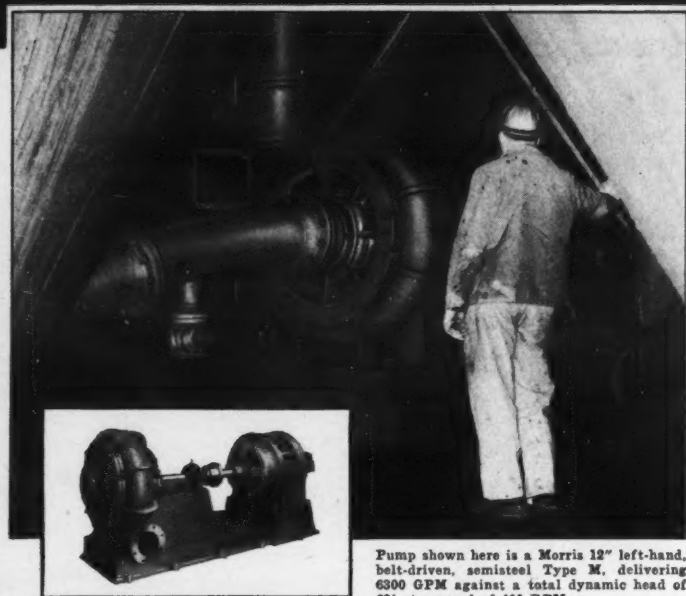


Cleveland Auditorium - June 5-8

**TOWMOTOR**  
THE ONE-MAN-GANG®

When inquiring check CP 4834 opposite last page

... for overall economy in  
delivering circulating water



Pump shown here is a Morris 12" left-hand, belt-driven, semisteel Type M, delivering 6300 GPM against a total dynamic head of 62' at a speed of 405 RPM.

## MORRIS Type M Pump

The small high-speed pumps commonly used for circulating water are highly efficient—if the water is relatively free of fine abrasive materials.

When abrasive-laden water is carried, the high speed of these pumps accelerates the grinding action of gritty particles. Sealing rings are quickly cut and scored . . . the thinner casting sections break down rapidly—normal life expectancy is halved, frequently quartered.

### MORRIS DESIGN ASSURES ECONOMICAL LONG LIFE

Where total heads do not exceed 120 feet, the larger, low-speed Morris type M Pump is more efficient for handling circulating water containing abrasive solids. Even the occasional big "tramp" piece—always a threat to the small pump installation—goes through the Morris without trouble. Depending on the pump size and total head, speeds range from a low of 188 RPM to a high of 1119 RPM.

Wearing parts are double the thickness of conventional clear water pumps. With economical upkeep a primary consideration in the design, sections subjected to most wear have

been subdivided so that the greatest erosion bears upon smaller, less expensive parts. Optional use of special corrosion-and-abrasive-resistant alloys further increases the inherent long life on the Morris Type M.

Morris Engineers have been building pumps for all types of service for 88 years. Let them consult with you on your pumping problems. No cost. No obligation. Or, send for free Bulletin 175.

### MORRIS MACHINE WORKS

Baldwinsville, N. Y.

Representative in Principal Cities

**MORRIS** Centrifugal Pumps

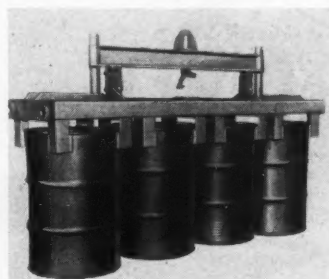
When inquiring check CP 4835 opposite last page

## MATERIAL HANDLING

**Handles three to six drums,  
no special spacing  
necessary**

**Uses:** Grab is designed for automatic handling and stacking of standard 55-gallon drums in quantities up to six.

**Features:** Automatic device permits operator to accomplish all loading and unloading merely by raising and lowering hoist line. Drums need not be specially spaced for pickup . . . only reasonably in line to facilitate placing grab on drums.



Device permits loading and unloading of grab by raising or lowering hoist line

**Description:** Unit handles all standard 55-gallon drums with shell or body diam of 22½". Grabs for special sizes can be supplied.

(Automatic drum grab is product of Downs Crane & Hoist Co., Dept. CP, 540 W. Vernon Ave., Los Angeles 37, Calif. . . . Check CP 4836 opp. last page.)

### Describes vibrating feeder

Bulletin outlines operating principles and specs of vibrating feeder, which can be electronically synchronized to match flow-speed of other equipment. Four-page booklet contains nine photographs showing device actually feeding a variety of materials, and a full-page engineering drawing details its design.

Bul 55-C is issued by Richardson Scale Co., Dept. CP, Clifton, N. J. When inquiring specify CP 4837 opp. last page.

## BULK MATERIAL CONTROL under Pressure or Vacuum

New Roto-Bin-Dicator mounts outside bin, at any angle, for bin level signaling or machinery control. Material loads on paddle actuate Micro switch in motor housing. Flexible paddle shaft permits use with large or lumpy materials when standard diaphragm indicators are impractical.



Low pressure air diffuser assures steady flow of fine, dry materials that tend to pack in storage.



The original diaphragm-type bin level indicator for all ordinary applications.

Complete  
Illustrated  
Literature  
FREE

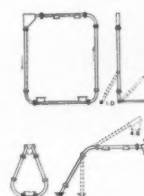
### THE BIN-DICATOR CO.

13946-D Kercheval • Detroit 15, Mich.  
Phone: VALley 2-6952

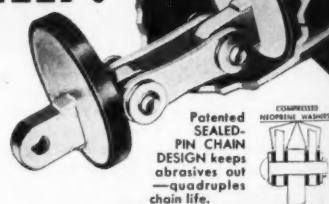
WE SELL DIRECT • PHONE ORDERS COLLECT

When inquiring check CP 4838 opposite last page

Examples of  
a few typical  
circuit  
plans.



**HERE'S  
HELP!**



## Hapman TUBULAR CONVEYORS

**Move almost any flowable  
material—wet or dry—through  
any plane or angle . . .**

**Make big savings!** Move bulk materials automatically—up, down, through walls, around corners and obstacles with a Hapman! Circuits like these or complex layouts engineered to your needs. Usually a single drive unit serves where other conveyors need several. Design cuts costs. Dust and liquid tight!

WRITE for Circuit Bulletin and Catalog C-46

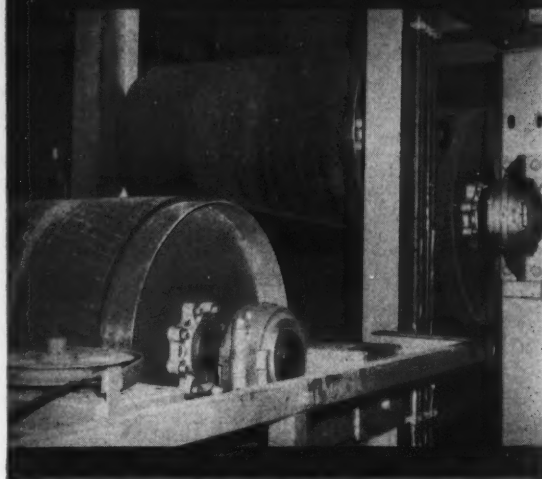
**Hapman CONVEYORS, INC.**  
DIVISION HAPMAN-DUTTON COMPANY  
KALAMAZOO MICHIGAN  
In British Commonwealth & Europe: Fisher and Ludlow Ltd., Birmingham

When inquiring check CP 4839 opposite last page

CHEMICAL PROCESSING



## TURNING POINTS—



Wherever conveyor belts *turn over*, industry turns to the American Pulley Company. In the basic chemicals particularly, where raw and semi-processed dry materials must be moved in quantity with accuracy, regularity and certainty, a high portion of recent installations are equipped with American Conveyor Pulleys.

Engineers and operators know they will get pulleys:

**ACCURATELY CROWNED** for true belt tracking.

**EQUIPPED** with the exclusive Wedg-Tite® split tapered hubs to prevent walking on the shaft . . . the only hubs designed specially for conveyor pulley service.

**DESIGNED** on theory, checked by independent research and proven in thousands of tough applications.

**AVAILABLE** with unique Gripex Spiralagging to eliminate slippage and prolong rim life . . . renewable with the pulley in place.

**BUILT TO LAST** . . . by controlled precision methods . . . by pulley specialists with over sixty years of experience.

When you install new conveyors or modernize existing ones, turn to American for Conveyor Pulleys—Built for the Belt . . . over 400 standard sizes.

**STOCKED AND SOLD BY DISTRIBUTORS IN PRINCIPAL CITIES**

*The American Pulley Company*  
4222 WISSAHICKON AVENUE  
PHILADELPHIA 29, PA.

When inquiring check CP 4840 opposite last page

APRIL 1956

## MATERIAL HANDLING

### Transmits weighings to data-handling devices

Designed to transmit weighings to remotely located tabulating card punchers, adding machines or other data-handling devices, unit bridges gap between indication of a weight and recording of this weight automatically in digital or numerical form at any remote location. Weights can be transmitted anywhere and be reproduced accurately in almost any form — tabulated, added, recorded or indicated in digital form. Digital conversion is achieved with maintenance of normal accuracy of the original, without electrical drift, non-linearity, or friction errors.

Basic element in unit is a motor-driven light source that scans the lines exposed on a special chart. Output is a series of pulses that pass through an electronic counter and translator to remote recording or indicating device. Typical applications of this unit include listing and totaling items passing over a monorail or roller conveyor, inserting weight data in punch-card billing records, recording of batch ingredients, or remote supervisory checking of weights.

(Designed for use on Toledo Industrial Dial Scales, unit is product of Toledo Scale Co., Dept. CP, Telegraph Rd., Toledo, Ohio . . . or for more information check CP 4841 on form which is located opposite last page.)

### Tells of skate-wheel conveyor

Giving details on line of galvanized steel gravity conveyor, single-page booklet explains galvanizing process used. Also included are construction details as well as descriptions of various installations.

Bul Gal-55 is issued by Rapids-Standard Co., Dept. CP, Rapids-tan Bldg., Grand Rapids, Mich. When inquiring specify CP 4842 on form which is located opposite last page.

a great name in lift trucks

## Hydrolectric

this powerful electric tractor hauls one or more trailing units with speed, safety and ease of operation.



Quiet and safe enough for hospitals—yet rugged enough for steel mills.

The one big difference in lift trucks is the exclusive Dyna-Dual power unit of the Hydrolectric



- 2 Drive Wheels instead of one
- 4 Wheel Stability instead of three
- Alloy Gear Transmission instead of chains
- 100% more Steering Ease —Greater Maneuverability
- 50% less Maintenance —Easy Accessibility
- Finger-Tip Control —Greater Safety

We invite you to learn more about it by writing for Catalog No. 65.

Hydrolectric moves more goods, quicker, easier and safer anywhere at less cost.

STUEBING Designed • Engineered • Built



**LIFT TRUCKS, INC.,** CINCINNATI 14, OHIO



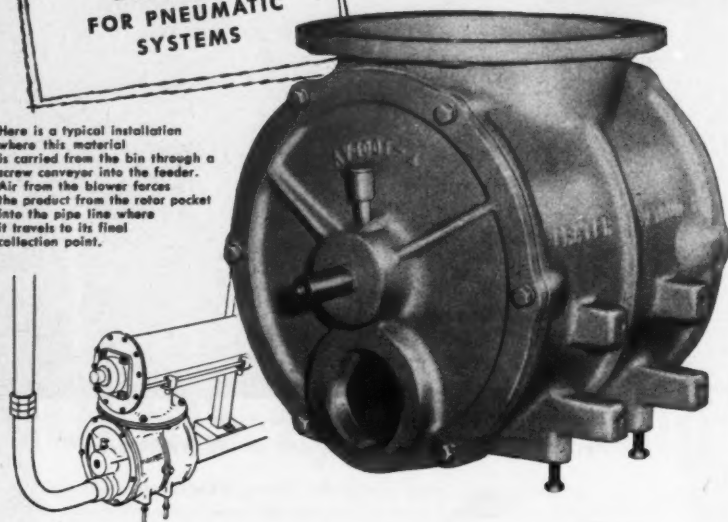
THERE IS A TRUCK FOR EVERY PURPOSE TO HANDLE ANY KIND OF MATERIAL.

When inquiring check CP 4843 opposite last page

# NEW! FOR HANDLING FREE-FLOWING PRODUCTS

## PRATER BLOW-THRU FEEDER FOR PNEUMATIC SYSTEMS

Here is a typical installation where this material is carried from the bin through a screw conveyor into the feeder. Air from the blower forces the product from the rotor pocket into the pipe line where it travels to its final collection point.



No matter how attritionized the product, this new Prater Blow-Thru Feeder will feed it efficiently and quickly into any pneumatic system. And this new design becomes an integrated part of the pipe line and will feed against pressures as high as 10 PSIG . . . either positive or negative!

One of the efficient design features of this unit is that on the horizontal center line of the body casing is a pressure neutralizing port to bring the rotor pockets to atmospheric pressure before filling.

There are many other interesting and high quality production features. Power requirements vary according to the fineness and abrasiveness of the product . . . flour, salt, carbon or any other material.

Available in cast iron and bronze . . . write today. Ask for our new airlock catalog, the most comprehensive in the industry!



FREE!

## PRATER PULVERIZER COMPANY

1517 S. 55th Court  
Cicero, Illinois

When inquiring check CP 4844 opposite last page

## MATERIAL HANDLING

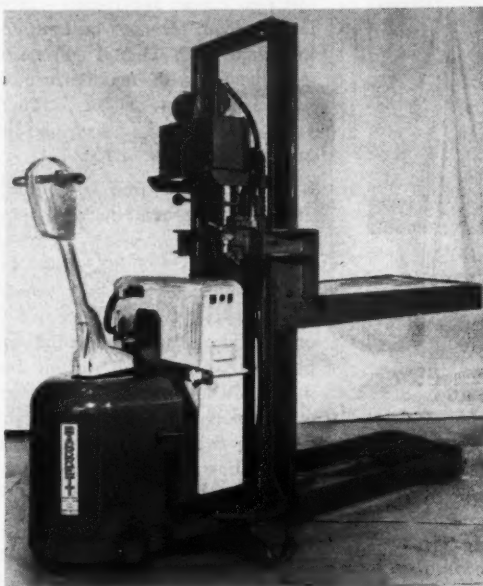
### High-lift platform truck reaches up to 72 inches . . .

Unit lifts and travels under electric power from 12-volt storage battery

**Uses:** Unit is designed for moving and stacking of skids, cases, crates, and other handling equipment carried on a platform.

**Features:** Operations are controlled by push-buttons located in handle.

**Description:** Standard unit has capacity of 4000 lb, but truck is also available with capacities up



Walkie truck is completely controlled by pushbuttons located in handle

to 6000 lb. Truck has a standard lift of 72 inches and higher lifts in both single and telescopic masts can be furnished for ceiling-high storage. Truck, with two forward and two reverse speeds, travels at two mph fully loaded.

(High-Lift platform truck is produced by Barrett-Cravens Co., Dept. CP, 630 Dundee Road, Northbrook, Ill. . . . or for more information check CP 4845 on form opposite last page.)

### Drawbar pull of 32.5 tons available in crawler

Printed in two colors, 16-page bulletin details large crawler tractor with drawbar pull of 65,000 lb.

HD-21 is issued by Allis-Chalmers Mfg. Co., Dept. CP, 1125 W. 70th St., Milwaukee, Wis. When inquiring specify CP 4846 opp. last page.

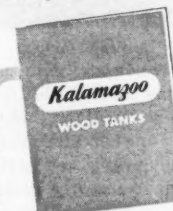
## Kalamazoo offers 3 bulletins to help you plan STORAGE BINS, TANKS, CHESTS for Bulk Materials in Process or Storage

1



Shows cross sections and details of Kalamazoo Industrial Storage Bin construction plus advantages of maintenance-free Kalamazoo Vitrified Glazed Tile. Application photos.

2



Eight pages describing round and rectangular Wood

Tanks, Special Vats, Flumes, Ducts and Frost-Proof Wood Boxings, used in processing and bulk storage. Construction details, numerous examples.

3



Illustrates Kalamazoo Split Tile and Unit Tile for straight or curved tanks and chests. Also Tile Lining for old or new tanks, pits. Applications shown.

### Fill out and mail coupon today.

**CHECK BULLETINS YOU WANT—**  
Kalamazoo TANK AND SILO CO.  
445 Harrison Street  
Kalamazoo, Michigan, Phone 5-2141  
☐ 1—Tile Storage Bins, Bul. 1153-B  
☐ 2—Wood Tanks, Bul. 655-W  
☐ 3—Tile Tanks, Chests, Bul. 1055-T

Name \_\_\_\_\_  
Title \_\_\_\_\_  
Firm \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

**Kalamazoo TANK & SILO CO.**

When inquiring check CP 4847  
opposite last page

CHEMICAL PROCESSING



**Picks rolls from against wall  
or other rolls . . .**

handles rolls from 24 to 48" diameter, either vertical or horizontal

**Uses:** Unit is designed for handling rolls from 24 to 48" diam from either vertical or horizontal position.

**Features:** In roll clamping operations it is desirable to have one fixed arm and one movable clamping arm. Design permits both arms to be



Clamp consists of one long and one short arm, permitting operator to pick up rolls from against wall or against one another

hydraulically movable — one at a time. Selector valve on clamp itself permits operator to make either arm movable while immobilizing opposite arm.

**Description:** Clamp consists of two hydraulically-operated arms, having gripping range of 22 to 52". Short arm contains articulated rubber-lined pad; longer arm contains two articulated rubber-lined pads. Combination of short and long arms enables operator to remove stored rolls that are immediately touching each other or touching wall.

Rotation of 360° is accomplished by chain and sprockets driven by hydraulic motor, enabling clamp to rotate indefinitely in the same direction. Roll clamp has all controls in operator's cab except selector valve which is located on clamp itself.

(Rotating roll clamp is product of Lewis-Shepard, Dept. CP, 193 Walnut St., Watertown, Mass. . . . or for more information concerning manufacturer's product, reader may simply check CP 4848 on the convenient Reader Service slip which is located opposite last page.)

# ERIEZ INTRODUCES NEW TYPE ELECTRO-PERMANENT MAGNETIC HI-VI VIBRATORY EQUIPMENT

**No Rectification . . .  
Superior Performance . . .  
Lower Operating Costs with  
Exclusive "Double Action" Drive**

No other vibratory equipment like this! Eriez Magnetic "know-how" brings you the first complete line of Electro-PERMANENT Magnetic Unit (Bin) Vibrators and Feeders operating at 3600 CPM directly off an AC line. Just plug or wire them in . . . NO RECTIFIER NEEDED!

**Look at these additional  
HI-VI advantages**

LOWER MAINTENANCE and OPERATING COSTS . . . LONGER, TROUBLE-FREE SERVICE . . . VERSATILE UNITS PROVIDE BROADER OPERATING RANGES WITH LESS POWER CONSUMPTION . . . HI-VI UNITS ARE COMPACT, LIGHTWEIGHT, EASILY INSTALLED, NEED NO REALIGNING . . . NO SLIDING OR ROTATING PARTS TO WEAR . . . No lubricants needed . . . Noise factor is reduced, working conditions improved . . . New type "double action" drive provides higher operating efficiency with low operating cost . . . Many HI-VI models are totally enclosed, weather-and dust-resistant.

**HI-VI's operating principle**

The Eriez HI-VI drive system, the heart of which is a lifetime powered Alnico V Permanent Magnet, in effect replaces rectifiers by providing an inherent magnetic rectification system which provides more operating forces, no lost efficiency; all energy (two-way push-pull vibrating action) goes for productive performance.



HI-VI is the newest product of the Eriez Manufacturing Company, pioneer producer of permanent-powered magnetic separators for industry. Eriez HI-POWR Magnets are used to purify, retrieve and separate in processing lines of all types, and are available in a wide range of styles and sizes.

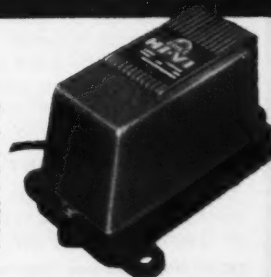


**HI-VI Vibratory Feeders . . .  
for accurate, controlled feed**

Vibramatically convey, spread, agitate, separate, blend, dry, cool and mix bulk materials economically in little space and at most any desired speed . . . from ounces to tons per hour! For all types of materials: dry, hot, dusty, lumpy, abrasive, etc. Faster processing at greatly reduced operating costs.

**HI-VI Unit (bin) Vibrators . . .  
keep materials flowing freely**

Versatile units are AUTOMATICALLY SELF-ADJUSTED according to load requirements, eliminate pile-ups, sticking, bridging and arching of bulk materials flowing from or through containers. Exclusive HI-VI double diaphragming (kneading) action keeps materials pouring smoothly and evenly through hoppers, bins, chutes, etc.



**ERIEZ MANUFACTURING COMPANY**

73D MAGNET DR., ERIE, PA.

Please send information on the new HI-VI vibratory equipment to:

NAME . . . . .

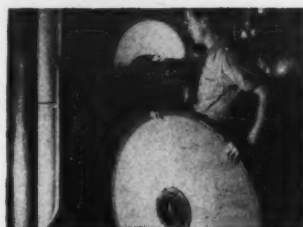
COMPANY . . . . .

ADDRESS . . . . .

CITY . . . . . STATE . . . . .

When inquiring check CP 4849 opposite last page

## when you need WIRE CLOTH PARTS



## Call Cambridge for accurate production, fast delivery

Our engineers in the field and in the home office are ready to discuss your wire cloth fabrication problems at all times. They'll help you select weaves, mesh sizes and metals to meet your needs and draw up prints for your OK . . . or, they'll start the factory working from your prints. Whether orders are small or large, you're assured of strict adherence to specifications by close manufacturing supervision.

Your parts will be fabricated from any conceivable type of industrial wire cloth, selected from the complete Cambridge line. Specifications from the finest to the coarsest mesh in any metal or alloy are usually met from stock, assuring the speediest delivery. Individual loom operation and careful inspection provide the maximum in mesh size uniformity and mesh count accuracy.

### IF YOU BUY WIRE CLOTH IN BULK . . .

You can get immediate delivery on large or small orders for the most frequently used types of cloth. If your needs are not in stock, we'll schedule our looms to get your material to you without delay.

**LET US QUOTE** on your next order for fabricated parts or wire cloth in bulk. Call your Cambridge **FIELD ENGINEER**—he's listed under "Wire Cloth" in your classified telephone book. **OR**, write direct for **FREE CATALOG** and stock list giving full range of wire cloth available, description of facilities and metallurgical data.



**The Cambridge Wire Cloth Co.**



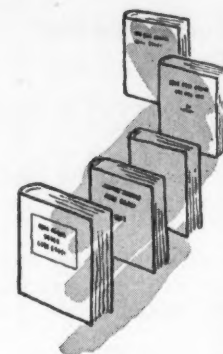
Department F,  
Cambridge 4,  
Maryland

WIRE CLOTH METAL CONVEYOR BELTS SPECIAL METAL FABRICATIONS

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

When inquiring check CP 4850 opposite last page

# Recent Books



## Theoretical Principles of Organic Chemistry

Reviewed by D. S. DAVIS  
Professor of Chemical Engineering  
Virginia Polytechnic Institute

Walter Huckel, professor of pharmaceutical chemistry at Tübingen University, Germany, has given us Volume I, a 904-page book that deals exhaustively with theories that concern the organic chemist. Inductive treatment is accorded chapters that are devoted to theoretical foundations, stereochemistry, oxonium compounds, compounds with abnormal valences of constituent elements, tautomerism, intramolecular rearrangements, steric rearrangements and the Walden inversion, unsaturated compounds, aromatic compounds, and the course of chemical reactions — in contrast to the deductive approach usual in books on this subject.

Although the author proceeds logically from fact to theory, adequate understanding of the book requires rather more organic chemistry than falls to the lot of American undergraduates.

In common with many books of European origin (this one was translated from the seventh German edition), Huckel's work presents a somewhat dreary appearance, largely through the amazing scarcity of subheadings. It is fortified with voluminous references to the literature and a 79-page detailed author and subject index. No one would dispute the publisher's claim that the book is a standard work in its field.

To obtain "Theoretical Principles of Organic Chemistry, Vol. I", remit \$15 direct to the Elsevier Press, Inc., Dept. CP, 402 Lovett Blvd., Houston, Texas. When inquiring specify CP 4851 on form which is located opposite last page.

## Comprehensive Inorganic Chemistry, Vol. IV

Reviewed by JOHN W. MURRAY  
Professor of Chemistry  
Virginia Polytechnic Institute

In each part of "Comprehensive Inorganic Chemistry, Vol. IV," edited by M. Cannon Sneed and Robert C. Brasted, general relationships and tables of physical properties of the elements covered and their isotopes are presented in the introduction. A chapter on each of the group II-B metals is included in "Part I, Zinc, Cadmium, and Mercury," written by Howard M. Cyr and the editors. Production, properties, and uses of metallic zinc and zinc oxide are discussed at length, as is the application of zinc coatings to the prevention of corrosion. This material is followed by a brief description of many of the more important compounds. The chapters on cadmium and mercury are similar in pattern, but are less detailed.

In Part II, written by Thomas D. O'Brien and the editors, Chapters 4 and 5 are devoted to scandium and yttrium; all the lanthanides are found in Chapter 6.

Series is not intended to provide complete coverage of the chemistry of the elements treated, but an effort is made to correlate chemical properties with structure. Volume IV seems to achieve its purpose in this respect, but it suffers from over-emphasis on brevity. The new developments in the separation of members of the lanthanide series deserve a fuller treatment.

This 193-page book is well-written and quite legible, though the photographs suffer from the choice of paper.

To obtain "Comprehensive Inorganic Chemistry, Vol. IV" remit \$5 direct to D. Van



*reviews of current technical and reference works  
... summarized for you by authorities in the field  
working with the CP staff*

Nostrand Co., Dept. CP, 250 Fourth Avenue, New York 10, N. Y. When inquiring specify CP 4852 on form which is located opposite last page.

#### Fifth Symposium (International) on Combustion

Assembled by the standing committee on combustion symposia of The Combustion Institute, this collection of papers presented at the Fifth International Combustion Symposium in Pittsburgh in 1954 begins with eleven reviews of problems on combustion in engines and kinetics of combustion. It proceeds through ninety papers, many of which are quite mathematical. One hundred and eighty-two authorities deal competently and at length with numerous phases of combustion of fuel droplets, propellant burning, combustion of solids, diffusion flames, carbon formation, combustion in engines, special techniques, kinetics of combustion reactions, flame spectra, and dissociation energies. Panel discussions of heterogeneous burning and kinetics complete the volume.

Most of the papers are authenticated with a generous number of references to the literature; many bear at their ends, in small but clear type, comments by other experts. One cannot fail to be impressed by the tremendous amount of work that has gone into the preparation of this collection.

The book, which consists of 802 double-column pages, is well-illustrated. The line cuts, equations, and tables are clear, and the paper, exhibits no show-through.

To obtain "Fifth Symposium (International) on Combustion" remit \$15 direct to Reinhold Publishing Corp., Dept. CP, 430 Park Ave., New York 22, N. Y.

#### Chemical Engineering Cost Estimation

Reviewed by D. S. DAVIS  
Professor of Chemical Engineering  
Virginia Polytechnic Institute

Chemical engineers who have become liaison officers between technical and business facets of project proposals have, at last, an authoritative handbook devoted to cost estimation. Aries and Newton, by no means newcomers to this field, have sifted the wealth of haphazard literature on the subject, have added many of their own contributions, and have served up 263 delectable pages of well-organized material that should receive a warm welcome.

Proceeding from definitions and fundamental concepts in an initial chapter, the authors present 52 one-page logarithmic plots that deal with costs of equipment, and twenty-eight that are concerned with other physical plant costs.

Thirty-nine pages of prices of chemicals, supplemented with tables that enable one to estimate labor requirements, wages, salaries, maintenance costs, requirements for the utilities, depreciation, and taxes, constitute most of an exceptionally strong treatment of manufacturing costs. Further chapters devoted to sales and profits, effects of variable conditions, the bearing of plant location on costs, components of costs, and economic evaluation precede nineteen sample problems worked out in gratifying detail. Throughout, the charts and tables are backed up with literature references found at the end of each chapter.

To obtain "Chemical Engineering Cost Estimation" remit \$6 direct to the McGraw-Hill Book Co., Inc., Dept. CP, 330 West 42nd Street, New York 36, N. Y.

## Cut Your Gauging Costs with the "Varec" Fig. No. 2500 AUTOMATIC TANK GAUGE



View of the new Watson terminal of the Southern Pacific Pipe Line. "Varec" Fig. 2500 Series Gauges are used on the entire line from El Paso to Watson.

After two years of research, development and testing at the plant and in the field in several types of service, the first "Varec" Figure No. 2500 Automatic Tank Gauge was sold in February 1952.

Since that time several improvements have been made. Now there are over 4000 of these Gauges in all kinds of service throughout the world.

This phenomenal volume resulted because the "Varec" Figure No. 2500 first introduced the Neg'ator Motor to the Petroleum Industry. The Neg'ator Motor is a novel spring mechanism that is stressed sequentially by increments and NOT by winding, in contrast to the conventional spring. It is a self-winding spring and maintains constant tension throughout float travel. It eliminated calibrated tapes, counter-weights and slip joints, thus providing easy installation.

Another revolutionary feature is the direct reading counter-dial, with large distinct numerals close to the look-box face. This unit is carefully sealed off from the vapors, grease

and dirt that plague tape-reading gauges to assure a clean, accurate reading in feet, inches and eighths, or inches and tenths, or the metric system.

All the parts incorporate materials and workmanship of the highest quality and are designed for long life, maximum service and minimum maintenance. Type 316 stainless steel ball bearings throughout. Housing is aluminum and all other parts are either aluminum or type 316 stainless steel. No plastic parts to warp, deteriorate or collect static electricity.

Provides for attachment of remote transmission systems or high-low control switches (either electric or pneumatic). Unnecessary to remove tape for punching, or to buy a new tape. Remoting equipment mounted outside Gauge Head without dismantling the Gauge Assembly.

Serves all types of tanks up to 66 feet in height and pressures to 300 p.s.i.g.

For full information write the factory or contact your nearest "Varec" representative.

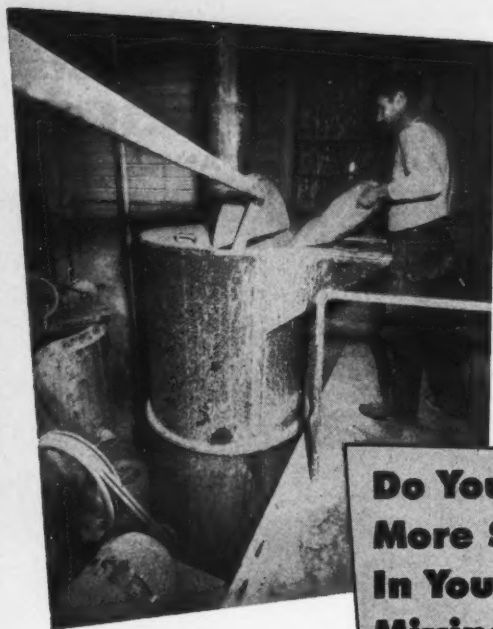


THE VAPOR RECOVERY SYSTEMS COMPANY  
Compton, California, U. S. A.

Cable Address:  
Varec Compton California (U.S.A.)  
All Codes

981-13

When inquiring check CP 4853 opposite last page



Charging the Abbé Dispersall Mixer described here

**Do You Want  
More Speed  
In Your  
Mixing Cycle?**

## ... then Investigate the Abbé Dispersall Mixer

Here's what a user in the ceramic field has to say about fast mixing cycles:

"We mix a 5000-lb. charge of air-floated clay and other ingredients in a total of 60 minutes—35 minutes to charge, and 25 minutes to mix. Our experience has been that a similar amount of slip with the standard equipment used in the industry would require several blunges for the same amount of ingredients. Before installing the Abbé Dispersall Mixer, our blunging cycle was a minimum of 4 hours per mix."

### FOR MOST FLUID MIXES AND PASTES

... the Abbé Dispersall Mixer gives you power and speed, plus the tremendous advantage of easy cleaning, which readily allows shifting from one color or formulation to another. Tooth pastes, creams, ointments, latex and other paints, inks, colors, pharmaceuticals ... these are just a few of the products that are mixed and dispersed better and faster in the Abbé Dispersall Mixer in a ONE-stage operation.

**WRITE FOR CATALOG 78**

**ABBÉ ENGINEERING COMPANY**  
50 Church Street • New York 7, N. Y.  
Address Department 46

When inquiring check CP 4854 opposite last page

## processing equipment

Protection Products shortened mixing  
cycles by 25% when they —

*cut heating unit  
space in half*

**Not only do present heaters  
increase rate of heat  
transfer, they also permit  
better mixing**

**Problem:** Pipe coils that were used in mixing tanks for heating batches of Protection Products' water repellent preservatives,\* were a source of many difficulties. Not only did these heating coils of 2" pipe take up a lot of space, reducing efficiency of agitator and capacity of tank, but they also trapped solid particles between pipes. This increased mixing time and made tanks hard to clean.

These mixing tanks range in size from 600 gallons to 3000 gallons, and some-

**FRANK E. McELROY**, Assistant Editor  
With **L. I. WINEBRENNER**, Laboratory Director  
Protection Products Manufacturing Company  
Kalamazoo, Michigan

\*One well-known product is "Woodlife," a water-repellent wood preservative made from water repellent materials, Dow Chemical's *penta*-chlorophenol and other chlorinated phenols in a high boiling petroleum solvent.



Fig. 1—Routine inspection of two plate-type heat transfer units in a 2700 gallon mixing tank. Heating units are curved to fit inside perimeter of tank



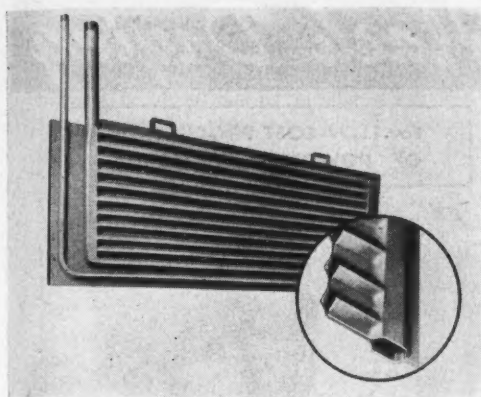


Fig. 2—Closeup shows how steel plates are embossed and welded to give easy and efficient flow to steam

times they were not filled completely. When this happened, a batch was often scorched on the exposed coils.

**Solution:** The year 1953 witnessed the start of a big change. The pipe coil heaters in two of the tanks were replaced with Style 90 Platecoils. These are made of two embossed sheets of mild, cold-rolled steel, welded together to effectually form a series of coils (see Fig 2). Platecoil can be rolled to fit inside of tank perimeter, as specified. The exact overall dimensions are determined by heat transfer rate desired.

The Platecoils are suspended along the side of the tank and rest on tank bottom. Connecting pipes for steam and condensate go up the inside wall of mixing tank (see Fig 1). Units are very easy to install.

**Results:** In addition to saving about 50% in heating space requirements, present heat transfer units permitted a 25% reduction in mixing cycles, due to better heat transfer and better agitation. They did not trap solids and cleaned by draining. A whipping action caused by expansion and contraction keeps any scale from forming. No scorching has taken place with partial batches.

In addition to the above, Protection Products has found that welded, one-piece construction of heat transfer unit — and pipe connections high up in the mixing tank — have eliminated chance for any leaks occurring. In these water repellent formulations, any water contamination would ruin a batch.

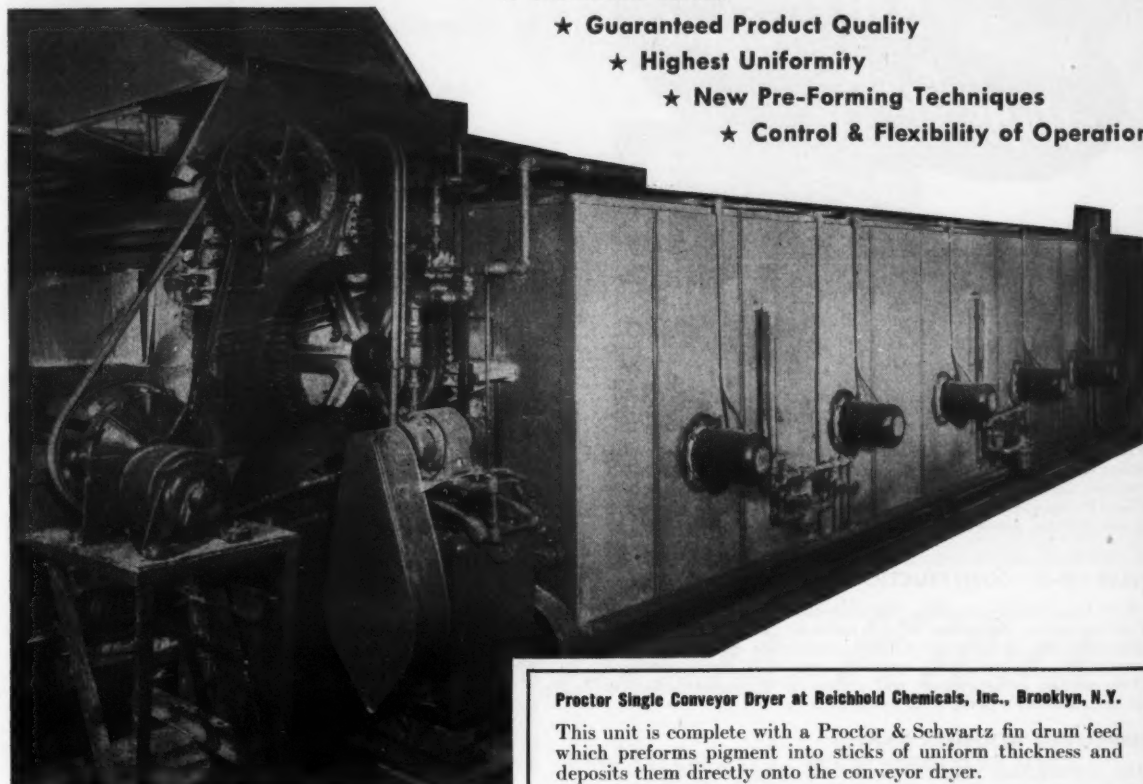
As a further testament to how well Platecoils have performed, Protection Products now has them installed in six mixing tanks and has plans to place them in two others.

(Platecoils are a product of Tranter Manufacturing Co., 735 E. Hazel, Lansing 4, Mich. . . . or for more information check CP 4855 on form which is located opposite last page.)

# More PROFIT with PROCTOR!

## PROCTOR DRYING RANGES OFFER:

- ★ Increased Yields
- ★ Guaranteed Product Quality
- ★ Highest Uniformity
- ★ New Pre-Forming Techniques
- ★ Control & Flexibility of Operation



Proctor Single Conveyor Dryer at Reichhold Chemicals, Inc., Brooklyn, N.Y.

This unit is complete with a Proctor & Schwartz fin drum feed which preforms pigment into sticks of uniform thickness and deposits them directly onto the conveyor dryer.

Proctor Drying Ranges make possible continuous conveyor drying of many materials formerly dried by batch processing.

Use of these ranges means

- More Profit
- Uniform Drying
- Consistent Quality of Product

Proctor equipment carries performance guarantees based on wide experience and careful analysis of your requirements.

Write for complete information

- Tray Dryers
- Truck Dryers
- Spray Dryers
- Other Proctor Equipment for use in the Process Industries.



## PROCTOR & SCHWARTZ, Inc.

Manufacturers of Industrial Drying Equipment and Textile Machinery  
Philadelphia 20, Pa.

When inquiring check CP 4856 opposite last page

Keep Ahead in '56...  
With "NATIONAL"  
High-Speed Dryers



You can stay in the lead . . . with faster production, lower operating costs and improved product . . . through operation of "NATIONAL" Conveyor Dryers . . . the ultimate in modern Dryer design and efficiency. Pictured above: Upper, large Multiple-Unit, Multiple-Apron dryer; lower, fourteen-section Multiple-Unit Single-Apron machine.

#### NEW "P-4" CONSTRUCTION

"P-4" Construction means a precision-built, prefabricated, truss-type structure, providing a new measure of strength, rigidity and durability. Advantages to the customer are obvious: Longer service life for the Dryer; smoother operation; freer access for cleaning and maintenance; and reduction of installation time in the customer's plant of as much as 50%.

#### IMPROVED HOUSING PANELS

The new insulated panels (Patented and Patents Pending) used for the housing are larger, stronger, more rigid, and, with their 4" insulation, provide greater protection against heat loss. They are of trussed-and-tensioned, non-through-metal construction and incorporate expansion-contraction compensation.

#### IMPROVED AIR DISTRIBUTION AND CONTROL

The exceptionally high drying speed of "NATIONAL" Dryers results from a combination of adjustable fan power and unique air distribution system, controlled to assure equal volume of air to the entire run. There is no "shading" — no uneven drying. This arrangement permits drying at consistently higher speeds than those previously permissible.

#### SUPER-POWER FANS

"NATIONAL" has developed the adjustable-pitch principle into its axial-flow fans which provides for greater operating potential than heretofore used in any drying machinery. Greater speeds and volume of air can now be employed and adjusted to the specific requirements of the drying operation. Fan mountings, insulation and lubricating systems have been redesigned to provide improved smoothness of operation and virtually no maintenance.

Write for Complete Information  
**THE NATIONAL DRYING MACHINERY CO.**  
LEHIGH AVENUE and HANCOCK STREET  
PHILADELPHIA 33, PENNA.  
New England Agent: JONES & HUNT, INC., Gloucester, Mass.  
Cable Address: "NADRYMA" — W. U. Code

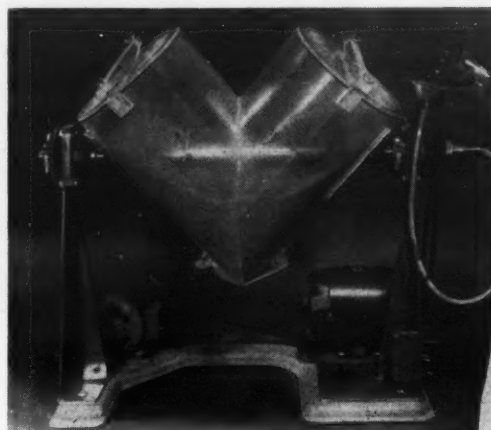
#### PROCESSING EQUIPMENT

### Liquids fed evenly, continuously to dry materials being blended in twin-shell unit

Fluids to 1000 cp viscosity enter blender through hollow intensifier bar

**Uses:** Blending liquids and dry materials in chemical, pharmaceutical, plastic, and food plants.

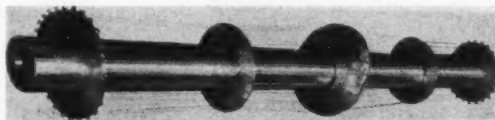
**Features:** Unit has hollow intensifier bar which makes it possible to feed liquids evenly into the dry materials during blending. Fluid introduction can be adjusted to give optimum results. Liquids with vis-



Plastic laboratory model of blender in action. Liquid is added at right

cosities up to 1000 cp have been handled successfully. Blending time is reduced considerably.

**Description:** Liquid-feed blender consists of hollow intensifier bar revolving inside a twin-shell blender. Liquid is introduced through bar's core, being released through nozzle directed at both sides of a revolving offset disc. Liquid droplets are flung



Close-up shows wire cage, offset center disc and opening (left) to hollow core of intensifier bar

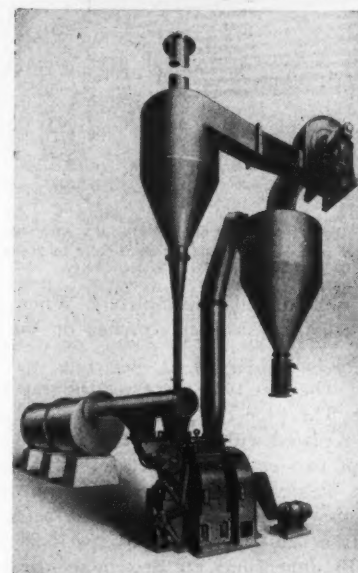
from edge of disc by centrifugal force. This, combined with the wiping action of the dry material on the disc, achieves effective dispersion.

Formation of clumps is prevented by means of a cylindrical wire cage surrounding the intensifier bar and revolving with it. Wires are made of stainless steel and are held in place by additional discs (see

RAYMOND

## Flash Drying

For LOW-COST PRODUCTION  
OF POWDERED MATERIALS



It dries  
as it  
grinds

Clean,  
dust-  
free

Typical Raymond Imp Mill with Flash Drying Accessories for drying-and-grinding in one simultaneous operation.

THE removal of moisture while pulverizing a material is an important function of a Raymond Roller Mill, Imp Mill or Cage Mill.

Since this method eliminates separate dryers, shortens the time of process and combines the whole operation in a single unit of equipment, Raymond Flash Drying System offers a proved method of making fine grade powdered products at new low costs.

If you are manufacturing chemicals, colors, fillers, food products, industrial wastes, synthetic resins or similar materials, be sure to compare the advantages of Raymond equipment.

RAYMOND

Flash Drying  
CATALOG  
No. 82

28 Pages of  
detailed  
information

Write for  
our new  
Catalog  
No. 82

**COMBUSTION ENGINEERING, INC.**  
*Raymond Division*

1317 North Branch St., Chicago 22, Ill.  
Sales Offices in Principal Cities  
Combustion Engineering-Superheater Ltd. Montreal, Canada

When inquiring check CP 4858 opposite last page

CHEMICAL PROCESSING

When inquiring check CP 4857 opposite last page



## PROCESSING EQUIPMENT

photo). From 8 to 16 wires, usually  $\frac{1}{8}$ " thick, are used.

Bar rotates at speeds ranging up to 1500 rpm. Maximum peripheral speed of wires as they cut through material is 2000 fpm. By varying speed of bar or size of wires, it is possible to reduce particles to very fine size. An intensifier bar studded with pins, instead of strung with wire, can be used for heavy, coarse granular or abrasive material. Bar is easily removed for cleaning.

Blender will accommodate liquids heated up to 250° F. Available in various materials of construction, units range from 3 to 50 cu ft capacity. Average blending time for materials that formerly required hours is 10-15 minutes. Extremely viscous liquids may take up to half an hour.

(Liquid-feed blenders were developed by The Patterson-Kelley Co., Inc., Dept. CP, 10 Lackawanna Ave., East Stroudsburg, Pa. . . . or for more information reader may simply check CP 4859 on form which is located opposite last page.)

### Tells how cleaning devices boost filter performance

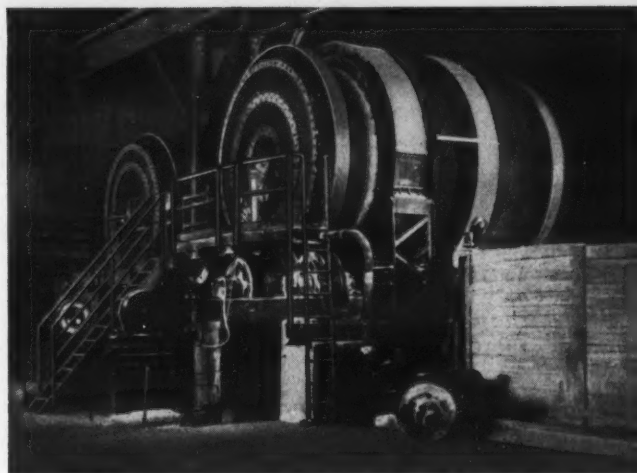
Devices for increasing filtering performance and convenience are described in eight-page bulletin. Available on manufacturer's line of vertical filters, they include filter leaves that can be lifted without unbolting, bottom and top outlet leaves, quick opening cover, bottom opening filter chamber, and individual leaf outlets. Literature also discusses air wash, sluicing, and shaking devices.

Bul 111 is issued by Industrial Filter & Pump Mfg. Co., Dept. CP, 5916 Ogden Ave., Chicago 50, Ill. When inquiring specify CP 4860 on form opposite last page.

### Tablet presses have all controls mounted at front

Two rotary tablet machines, having operating pressure of 10 tons and 4 tons, are described in illustrated six-page bulletin. Explained in detail are design features which make for simplicity in setting up and adjusting their operation. These include grouping of all controls at front of press, locating feed frames where they can be seen from operator's normal position, individual die screws, and single push-button control over compacting pressure.

Bul 650 is issued by F. J. Stokes Machine Company, Dept. CP, 5500 Tabor Road, Philadelphia 20, Pa. When inquiring reader may simply specify CP 4861 on the convenient Reader Service slip which is located opposite last page.



Two Semi-Continuous Batch Rotary Kilns Pre-heating Electric Furnace Charges.



Two Oil-Fired Rotary Kilns in Midwestern Manufacturing Plant.

Rotary Waste Disposal Kiln Showing Skip Loader and Brick Ash Collection Chamber.



# Batch AND

# Continuous Kilns

## 3 TYPES for a wide variety of pre-heating, processing and disposal operations

Bartlett-Snow batch kilns are ideally suited for pre-heating electric furnace charges. They bring the material up to temperature and remove moisture with a less expensive gas or liquid fuel, and shorten the furnace heating cycle, increasing its output.

Gas or oil-fired continuous kilns are designed for applying ceramic coatings to granules, calcining and nodulizing ores, and oxidizing and reducing operations at temperatures from 1000° F to 2200° F. Cylinder rotating speed can be varied to control the time the material is under treatment. Burners are controlled automatically with radiation pyrometers.

Heated material can be cooled in separate equipment at gradually declining temperatures if desired.

Waste disposal kilns equipped with automatic equipment provide an efficient, smoke-free method of disposing of combustible liquids, sludges and other industrial waste materials.

Use our complete facilities, including materials handling, on your next job! It fixes unit responsibility; assures the smooth, synchronized operation of the entire project; and utmost economy and satisfaction!

DESIGNERS

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**BARTLETT  
B-SNOW**  
CLEVELAND 5, OHIO

FABRICATORS

ERECTORS

DRYERS • COOLERS • CALCINERS • KILNS — Complete Facilities Including Materials Handling

When inquiring check CP 4862 opposite last page

**designed  
engineered  
and fabricated**

**by**

**M & L**

The heat transfer and process units shown are only a very few of the many designed and fabricated by Manning & Lewis Engineering Co. every year.

This confidence *must* be warranted:

Our customers have proof, from long association that their heat exchange and process equipment will be:

**DESIGNED**

... for Top Quality Performance

**ENGINEERED**

... for Economy and Efficiency

**FABRICATED**

... with strict adherence to specifications and drawings

These claims are for *US* to prove! Send us your next job for quotation.

We are accustomed to working with all ferrous and non-ferrous metals.

**Manning & Lewis  
Engineering Co.**

30 Ogden Street Newark 4, New Jersey  
SALES REPRESENTATIVES IN PRINCIPAL CITIES

**M & L**

When inquiring check CP 4863 opposite last page

**PROCESSING**

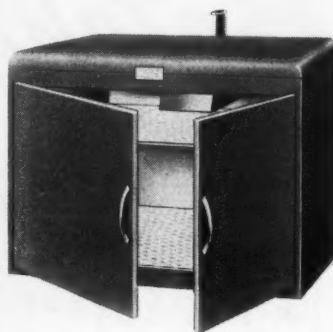
**Forced-air circulation  
featured on low-cost  
portable oven ...**

maintains uniform temperature throughout unit

**Uses:** Various drying applications in laboratory, pilot plant, or production work.

**Features:** Low-cost portable electric oven is capable of heating to 225°F in 15 minutes. Uniform temperature is maintained throughout unit by means of forced-air circulation system.

**Description:** Inside dimensions are 28 1/2 x 24 x 20 1/2" high. Construction is of heavy-gage steel with asbestos air-cell insulation.



Portable oven heats up to 225°F within 15 minutes

Removable shelf permits use of entire height. Ovens are so constructed that one will nest on top of another if they are used in groups.

Fresh air is drawn in and stale air driven out through vents by means of fan driven by motor mounted on outside of the unit. Adjustable damper permits wide range of temperatures. Oven has single-phase 110-volt motor. Larger units for higher temperatures are also available.

(Model CR-1 portable oven is product of Grieve-Hendry Company, Inc., Dept. CP, 1401 W. Carroll Avenue, Chicago 7, Illinois ... or for more information about manufacturer's product reader may simply check CP 4864 on form which is located opposite last page.)

**3 WAYS  
SPERRY CUSTOM FILTRATION  
... HELPS YOU!**

**Experience-** SPERRY OFFERS YOU the knowledge gained thru 88 years designing and constructing thousands of filter presses for hundreds of industries

**Equipment-** SPERRY OFFERS YOU a complete selection of the finest filter presses, standard or special all types and sizes of filter media ... plus the widest selection of closing devices and other time-savers—for all types of industrial filtration.

**Engineering-** SPERRY OFFERS YOU free consultation. Our laboratory and engineering departments are always at your disposal for information regarding your filtration problems ... without cost or obligation.

Write for Free 44 page Catalog today

**D. R. SPERRY CO.  
BATAVIA, ILLINOIS**

**Sales Representatives:**  
George S. Tarbox, 808 Nepperon Avenue, Yonkers, New York  
Aldridge & McCabe, 847 E. 17th Ave., Denver 18, Colo.  
B. M. Pillsbury, 833 Merchants Exchange Building, San Francisco 4, Calif.  
Texas Chemical Engr. Co., 4101 San Jacinto Houston 4, Texas



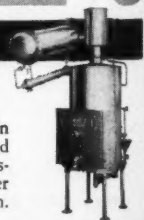
When inquiring check CP 4865 opposite last page

**SALE!**

**DISTILLED WATER**

**only 1/2¢ per gallon**

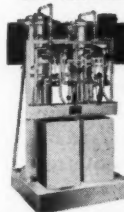
Put a Barnstead Pure Water Still to work in your plant or laboratory. Since 1878 Barnstead equipment has been producing the purest distilled water — and at the lowest cost, too! Over 200 different sizes and models to choose from.



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**only 5¢ per 1000 gallons**

Barnstead Demineralizers in capacities of 5 to 3000 G.P.H. effectively remove ionizable impurities, making low-cost demineralized water available for countless manufacturing, processing, and laboratory operations.



More than 60,000 Barnstead Stills and Demineralizers now in use in every country ... in every industry. Write for accurate, impartial answers to your Pure Water Problems.

New York Office  
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**Barnstead  
STILL & STERILIZER CO.**

66 Lanesville Terrace, Forest Hills, Boston 31, Mass.

When inquiring check CP 4866 opposite last page

**CHEMICAL PROCESSING**



### Directory classifies firm's products, literature

Alphabetical description of company's products and descriptive literature is presented in 9x4", 24-page directory. Booklet also gives history of firm and lists location of 17 plants, sales offices, and tractor branch houses. Almost 200 classifications of products are included.

Bul "This is A-C From A to Z" is issued by Allis-Chalmers Mfg. Co., Dept. CP, 1151 S. 70th St., Milwaukee, Wis. Specify CP 4867 opp. last pg.

### Technical catalog covers heat exchangers

Departing from the usual practice of offering tabulated performance data, 32-page catalog uses a system of easily understood curves and examples to present heat exchanger performance under varying field conditions. Also covered are comparisons of various types of shell-and-tube heat exchangers.

Cat 552 is issued by E. C. Cooley Co., Dept. CP, 1186 Folsom St., San Francisco 3, Calif. Specify CP 4868 opp. last page.

### Catalog describes line of dispersion mills

Descriptions, performance data, physical data, and specifications of dispersion mills are presented in 16-page catalog. Tank capacities of mills range from 1 gallon to 210 gallons. Photographs and working drawings highlight catalog.

Cat "The Kady Mill" is by Kinetic Dispersion Corp., Dept. CP, 95 Botsford Pl., Buffalo 16, N.Y. Specify CP 4869 opp. last pg.

For more information on product at right, specify CP 4870 . . . see information request blank opposite last page.



GET EFFICIENT MIXING, plus built-in adaptability to process changes, with turbine-type LIGHTNIN Mixers.

## Use this proved method to get good fluid mixing

You can't afford to *guess* about fluid mixing. And you don't need to.

On any mixing operation you can get factual answers to questions like these, to guide you in your mixer selection:

1. What precise balance of *fluid flow* and *fluid shear* will do my mixing job best?
2. If this balance can be attained in different ways, what is the *most efficient* and economical way?
3. In scaling-up, does power required per unit volume remain constant? If not, by what factor does it increase or decrease?
4. Will the mixer transmit the required power to the mix, and do it efficiently?
5. Can the mixer be installed without

special construction? Can I get standard replacement parts quickly if I ever need them?

6. Am I protected against mixer obsolescence in case of a process change?

You *know* the answers to these vital questions, when you mix with LIGHTNIN Mixers.

#### Predicting results

Even on the simplest mixer application, your LIGHTNIN sales engineer's recommendation is based on thousands of pilot runs, plus years of in-the-field experience.

On complex mixing jobs, pilot runs at Mixco quickly find the impeller-to-tank diameter ratio and input power that will produce the optimum fluid regime

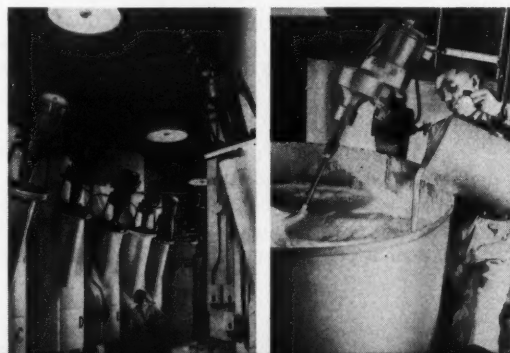
most economically. Scale-up is *guaranteed accurate*.

#### Mechanical economy

Your mixer investment goes into equipment that is mechanically up-to-the-minute. Hundreds of *standard* LIGHTNIN power-speed combinations (interchangeable in many models); widest possible choice of in-stock materials and interchangeable components, give you assurance of correct application, smooth running, and flexibility when you need it.

For fluid mixing that does what you want it to do, call in your LIGHTNIN Mixer representative. (He's listed in Chemical Engineering Catalog.) Or write us direct.

Left: ANY TANK, regardless of size or shape, can be fitted with a LIGHTNIN Mixer for correct mixing. Right: Make any open tank an effective mixing unit, with a LIGHTNIN Portable Mixer. Thirty models.



## Lightnin® Mixers

MIXCO fluid mixing specialists

FOR LATEST MIXING INFORMATION and full description of LIGHTNIN Mixers, send for these helpful bulletins:

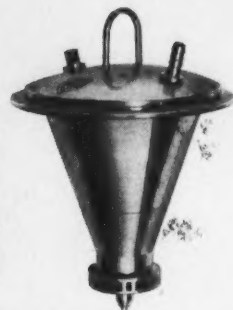
- |  |  |  |
|--|--|--|
| <input type="checkbox"/> B-102 Top or bottom entering; turbine, paddle, and propeller types: 1 to 500 HP | <input type="checkbox"/> B-104 Side entering: 1 to 25 HP                   | <input type="checkbox"/> B-111 Quick-change rotary mechanical seals for pressure and vacuum mixing |
| <input type="checkbox"/> B-103 Top entering; propeller types: ¼ to 3 HP                                  | <input type="checkbox"/> B-112 Laboratory and small-batch production types | <input type="checkbox"/> B-107 Data sheet for figuring mixer requirements                          |
| <input type="checkbox"/> B-108 Portable: ¼ to 3 HP   | <input type="checkbox"/> B-109 Condensed catalog showing all types         |  |

Check, clip, and mail with your name, title, company address to:

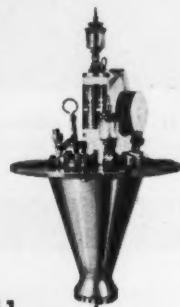
**MIXING EQUIPMENT Co., Inc., 185-d Mt. Read Blvd., Rochester 11, N. Y.**  
In Canada: Greay Mixing Equipment, Ltd., Toronto 10, Ont.

# "TOPS"

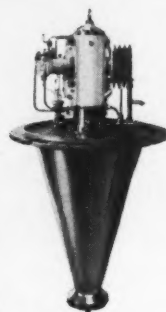
... in Design—for the  
best in Spray Drying



"MINOR"



TS-11



F-35

## Nerco-Niro<sup>®</sup> Spray Dryers

... incorporate a complete line of centrifugal atomizers—tops in design and workmanship—to handle production capacities from a few pounds to 36,000 pounds per hour.

Special Nerco-Niro designs can be supplied for abrasion-resistance and corrosion resistance, for coagulating materials, for fine or coarse particles, high or low bulk density.

Write for Bulletins  
226 and 230.

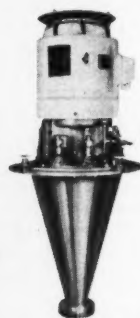
**Nichols Engineering  
& Research Corp.**

Nerco-Niro Spray Dryer Division

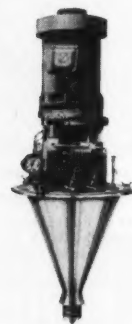
70 PINE ST., NEW YORK 5, N. Y.

1637 N. Illinois St., Indianapolis 2, Ind.

1477 Sherbrooke St. W. Montreal 25, Canada



F-45



F-75

When inquiring check CP 4871 opposite last page

## PROCESSING EQUIPMENT

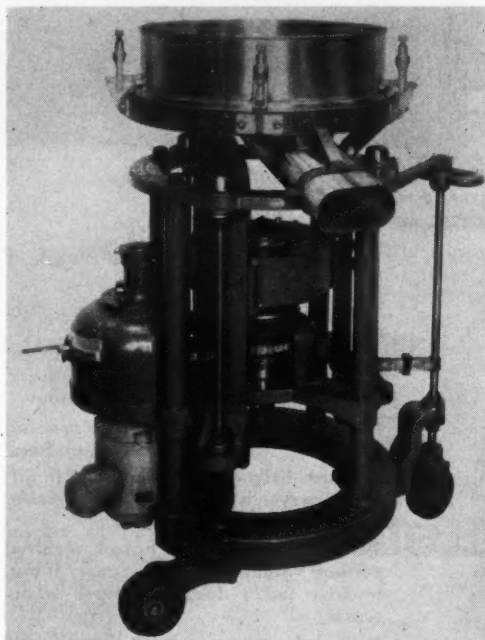
**Flexibility, silent operation  
advantages of vibrating  
screen separator . . .**

self-contained mobile unit can handle many products; capable of continuous production

**Uses:** Sifting, screening, or straining various liquids and solids.

**Features:** Separator is mobile, self-contained unit, capable of continuous, high-capacity production. Unit has virtually no wearing parts, assuring long life, and silent operation.

**Description:** Developed and produced in England, separator measures about 2 ft in diameter and 3 ft high. Unit is powered by a built-in totally-enclosed 1/3-hp motor. Except for on the flywheel,

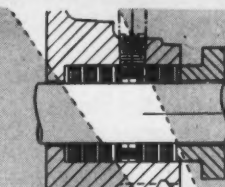


Mobile separator can be moved to different locations

no bearing surfaces are used in machine. Separator is mounted on three rubber-tread trolley wheels so that it can be moved from one place to another.

Mechanism which generates gyratory vibration is adjustable to produce various degrees of movement. Screen assembly is fastened to unit by three spring-type clamps. Screens can be exchanged or removed for cleaning in matter of seconds. Screens are available in various mesh sizes and in various materials of construction.

Typical examples of unit's performance follow: It will screen heavy glue through 100-mesh screen at rate of several tons per hr. Dry precipitated chalk can be processed through 200-mesh screen at rates of 550 pounds per hr. Material such as granulated sugar



**SNAPS ON AND  
OFF THE SHAFT**

*Quickly  
and  
Easily*

**CHEMPRO  
Teflon<sup>®</sup>  
SEAL CAGES<sup>®</sup>**

Flexible Chempro Teflon<sup>®</sup> Seal Cages, for lubricating or cooling stuffing box packing, snap on and off a shaft quickly and easily. They eliminate the time-consuming job of "pulling" the shaft required when conventional lantern rings are used. Machined in a single piece, they fit snugly, with no movement or vibration, even at very high shaft speeds. Their tough construction prevents bending or collapsing under extreme gland pressure.

Chempro Seal Cages do not score shafts as do two-piece metal lantern rings, eliminating the expense of replacing badly scored shafts.

For corrosive service they are unbeatable, lasting many times longer than metal rings under continuous contact with acids, organic solvents, thionyl chloride, etc., at normal and elevated temperatures.

They are made in sizes to fit any shaft diameter and stuffing box bore.

Write for new Chempro Bulletin on the patented Seal Cage.

THE ORIGINAL FABRICATORS OF  
TEFLON PACKINGS AND GASKETS

Patented. Teflon<sup>®</sup> trademark



**CHEMICAL & POWER  
PRODUCTS, Inc.**

9 Broadway, New York 4, N. Y.

When inquiring check CP 4872  
opposite last page

CHEMICAL PROCESSING



can be passed through 20-mesh screen at rate of 2 tons per hr.

Machine can be made dust-tight by use of hinged screen covers. Other attachments such as feed hoppers and special tray-type screens are also available.

(Finex vibrating screen separators are marketed in US by J. M. Lehmann Company, Inc., Dept. CP, 550 New York Avenue, Lynhurst, New Jersey . . . or check CP 4873 on form opposite last page.)

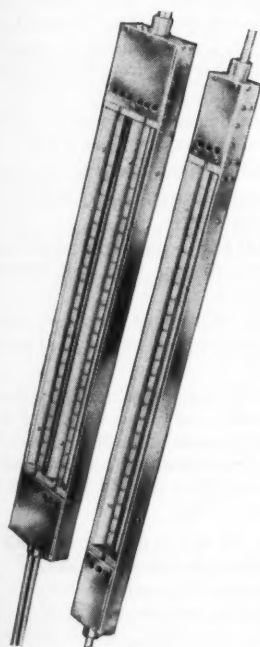
**Maximum heat reached instantly with infrared heaters . . .**

ideal for continuous webs and sheets or on other rapid-drying applications

**Uses:** Drying, treating, and conditioning coatings on paper, fiber, textiles. Units can be easily installed over conveyors or on sheet or web-fed machines for rapidly drying inks and other materials.

**Features:** In addition to reaching maximum heat instantly, quartz-enclosed elements cool quickly, reducing fire hazard which might occur if paper or other combustible material should fall against it.

**Description:** Infrared heating assemblies are available for any sheet or web speed and for any size processing machine where drying is required. Units can be connected to operate at high, medium, or low heat. Multiple automatic heat regulators for control of operating temperatures geared to the speed of the machine can also be supplied.



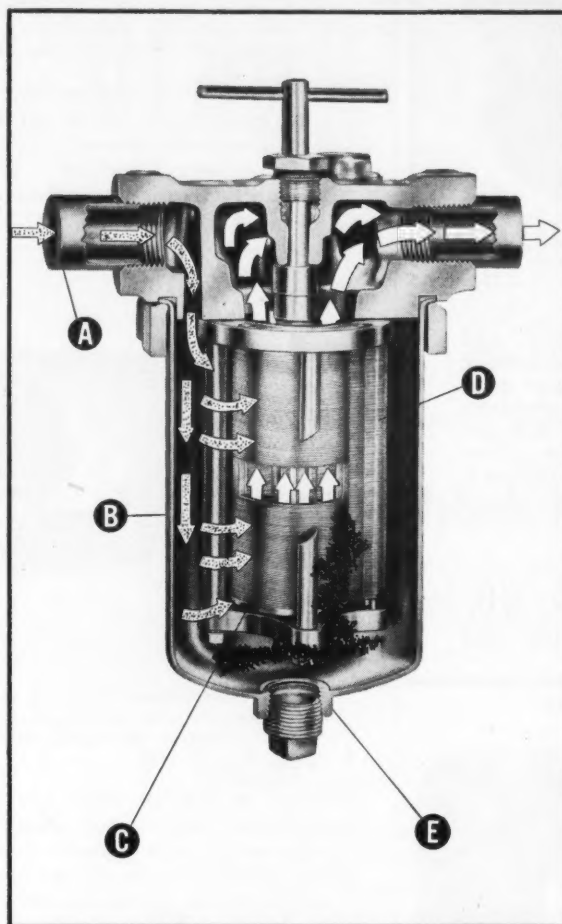
Accompanying illustration shows two typical assemblies. Right unit (fitted with one element) has 25" effective heating length. Overall length of reflector fixture is 36". Heater is rated at 2500w, 400-500v. Left assembly (with two elements) also has 25" effective heating length. Total

wattage is 5000, requiring 400-450v.

(Infrared heaters are product of The J. E. Doyle Company, Dept. CP, 1220 West 6th Street, Cleveland 13, Ohio. Check CP 4874 opposite last page.)

# New! CUNO SUPER Auto-Klean Filter

## A 40-micron, self-cleaning filter for process liquids



**HOW IT WORKS.** Dirty liquid enters inlet (A) at left, fills housing (B) and flows through metal edge-type filter (C). Clean liquid rises through center of filter, leaves at right. Dirt combed out by cleaner blades (D) is removed through drain (E).

...and you can clean this filter by simply turning the handle!

Many times smaller than other micron filters of equal capacity, Cuno's new SUPER Auto-Klean filter now makes possible economical, micron filtration at high flow rates and eliminates the need for replacement cartridges. Here's what SUPER Auto-Klean offers process industries:

1. *Micronic filtration* with a self-cleaning filter. Just turn handle to clean—continuously with motor drive or intermittently by hand.
2. *Eliminates cartridge changes.* Ends operating costs if you've been using cartridge filters.
3. *No pressure-drop build up.* An 8-in. long, 2 1/4-in. diameter cartridge handles 30 gpm of liquid at 50-centipoise viscosity with only 3-psi pressure drop—up to 75% more with a slightly higher pressure drop.
4. *Positive protection* against solid particles larger than 40 microns (actually 0.0015-in.). Can't rupture or channel.
5. *Much smaller* than replaceable-cartridge-type filters of equal capacity, you save on lower initial costs, lower installation costs, lower space requirements than for cartridge units. You get high capacity in a small package.
6. *No duplex units needed.* Handles full flow all the time with no interruptions for cleaning.
7. *SUPER Auto-Klean* fits existing Cuno Auto-Klean housings. You can easily replace most 2 1/4-in. diameter cartridges with SUPER Auto-Klean for finer filtration.
8. *SUPER Auto-Klean* is available in all-steel or type-316-stainless-steel construction with Teflon seal.

**WRITE TODAY** for your copy of SUPER Auto-Klean Catalog SAK-057 or discuss your specific process application with our engineers. Cuno Engineering Corporation, 5-4 South Vine Street, Meriden, Conn. 5.10

### Typical SUPER Auto-Klean installations

1. 50 gpm of organic solution, viscosity 100 to 130 cps at 80°C operating temperature and 125-psi operating pressure—40-micron filtration.
2. 1.2 gpm of polyethylene, viscosity 50,000 cps at 340°F, operating pressure of 2,000 psi and pressure drop of 800 to 900 psi—40-micron filtration.
3. 10 gpm of resin, 2,000 SSU at 500°F and 100-psi operating pressure—40-micron filtration.
4. 10 gpm of printing ink—40-micron filtration.
5. 20 gpm of coating liquid—40-micron filtration.
6. Phenolic water at 125-psi operating pressure on pumps—40-micron filtration.
7. 150 gpm of wax—40-micron filtration.

**Ideal for in-line installation before pre-coat filters.**



## ENGINEERED FILTRATION

Removes More Sizes of Solids From More Kinds of Fluids

**AUTO-KLEAN (edge-type) • MICRO-KLEAN (fibre cartridge) • FLO-KLEAN (wire-wound) • PORO-KLEAN (porous stainless steel)**

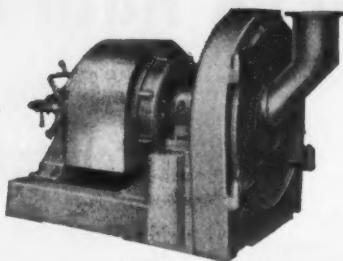
When inquiring check CP 4875 opposite last page

## DO YOU KNOW?

**BAUER**  
Single Disc Attrition  
Mills are Used for

- GRANULATING
- FLUFFING
- BLENDING
- TEXTURIZING
- MIXING
- FIBERIZING
- GRINDING

If you have a processing problem, we invite you to take advantage of our Research Laboratory. We maintain full-sized machines for evaluating operational data and helping our customers develop new processes.



Available in 7 sizes,  
8" to 44" diameter.  
Ask for Bulletins S-2, A-7, P-13.

In addition to single and double revolving disc attrition mills, we offer hammer mills, breakers, crushers, laboratory mills, cleaners, classifiers, specific gravity separators, and related machines. The full line is illustrated and described in our Catalog No. 52. A copy is yours upon request.

*Bauer*

**THE BAUER BROS. CO.**  
1728 SHERIDAN AVE. • SPRINGFIELD, OHIO  
Established 1878

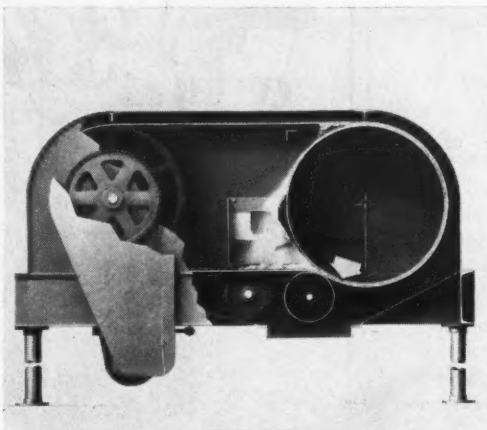
When inquiring check CP 4876 opposite last page

## PROCESSING EQUIPMENT

**Difficult materials dried easily  
on new drum dryer . . .**

compact unit handles variety of products

A new type of drum dryer has been developed for fast, efficient drying of difficult and sticky materials. Unit is compact, easy to install, and capable of handling a wide range of products — all the way from thick slurries to feeds that are distinctly granular.



Material being dried is carried in space between heated surface of drum and surface of stainless steel belt, as indicated by arrow

The type of materials which may be successfully dried include lead arsenate, sodium fluoride, ammonium sulfate, paint pigments, dyes, sewage, and pharmaceuticals. Pasty mixes, which are usually dried in tray dryers, can also be handled. No crushing is required after drying, as material does not cake in drying.

Unit consists essentially of a slowly revolving stainless steel drum heated by steam, hot air, oil, or other means. On outer edge of drum, at both ends, is a flange on which a continuous stainless steel belt is carried. Material being dried is carried in the space between the heated surface of the drum and the surface of the drum and belt.

In operation, material is forced horizontally across face of the drum by displacement caused by the continuous introduction of new feed. Material stays in contact with drum for about two-thirds of a revolution. Product is then plowed off and again fed to the drum.

This continuous plowing off from the drum and returning it to the moving belt continually agitates and mixes the material, thus improving moisture release and presenting new material surfaces to the heated drum. With every revolution the material is advanced a fraction of an inch across the width of the drum. Drying is complete when material has traversed the width of the drum and is plowed off into the discharge chute.

## KEL-F® fluorocarbon DISPERSIONS for corrosion-resistant... anti-adhesive COATINGS



Like this metal expansion joint, a number of surfaces can be given corrosion-resistant, protective coatings with the new dispersion form of KEL-F fluorocarbon plastic.

KEL-F Dispersions are finely divided particles of KEL-F plastic in a volatile medium. They can be applied by spraying, dip, or spreading to a variety of metallic and certain non-metallic surfaces. High-temperature baking fuses the dispersions into tough, adherent coatings that are corrosion-resistant, thermally stable, and anti-sticking.

Thus, fluorocarbon coatings not only protect process equipment from corrosion, but also provide a self-cleaning, non-contaminating surface that insures purity of process stream.

A unique combination of properties of the coatings suggests many areas of use:

**CORROSION RESISTANCE** — tankcars, piping, pumps, mixers, valves, flowmeters, reactors, containers.

**ANTI-STICKING** — agitators, calender and guide rolls, forming dies, cone blenders, casting molds.

**ELECTRICAL** — coated glass tape, distribution transformers, miniaturized stators and relays.

Kellogg will gladly work with you in developing specific applications for KEL-F Dispersions. If you do not maintain your own coating department, we can recommend experienced applicators. Write for more information.

**THE M. W. KELLOGG COMPANY**  
Subsidiary of Pullman Incorporated  
Chemical Manufacturing Division  
P. O. Box 469, Jersey City 3, N. J.



® KEL-F is a registered trademark of The M. W. Kellogg Co. for its fluorocarbon products.

When inquiring check CP 4878  
opposite last page

CHEMICAL PROCESSING

## Binks spray nozzles

for washing, cooling, processing,  
humidifying, dehydrating, and  
hundreds of other applications.

You'll get the right nozzles quicker by calling Binks...manufacturers of one of the most complete selections ever produced.

There is a size and spray pattern for every purpose...with nozzles cast or machined from standard or special corrosion-resistant metals and materials.

MAIL COUPON  
NOW!

**Binks**

A COMPLETE LINE OF  
INDUSTRIAL SPRAY NOZZLES  
AND COOLING TOWERS

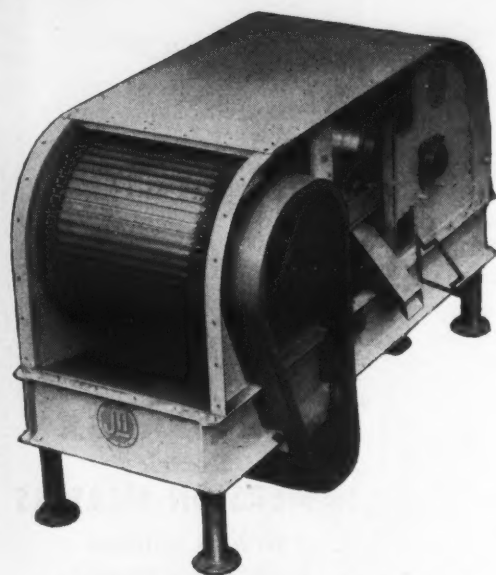


**Binks Manufacturing Company**  
3120-32 Carroll Ave., Chicago 12, Ill.  
O. K. Binks, send me your comprehensive Spray Nozzle Catalog without obligation.

NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

When inquiring check CP 4877 opposite last page





End view shows construction of stainless belt. Dried product leaves through discharge chute (arrow)

Dryer can be used for either batch or continuous operations. Unit is completely enclosed, requires minimum of floor space, and needs no heavy foundations. Feed may be introduced from either side of unit. Type and size of feeder is determined by material being dried. Facilities are available in manufacturer's laboratory for tests on specific products.

(Drumulator was developed by The Jeffrey Manufacturing Co., Dept. CP, Fourth St., Columbus 16, O.)

#### **Sifter makes eight separations, has self-balancing drive**

Ceiling-suspended sifters with self-balancing drive are pictured and described in four-page bulletin. Units are designed for high capacity and are capable of making up to eight distinct separations.

Bul 136 is issued by Sprout, Waldron & Co., Inc., Dept. CP, Muncy, Pa. When inquiring specify CP 4880 on form opposite last page.

#### **Stirrers, mixers described**

Full line of stirrers and mixers is described in illustrated four-page bulletin. Included are both laboratory and production units. Various models are shown ranging from 1/8 to 100 hp.

Bul 561 is issued by Conn and Co., Dept. CP, 11 S. Marion St., Warren, Pa. When inquiring specify CP 4881 on form opposite last page.

# Are Process Methods "dragging their feet" in the Chemical Industry?

Researchers are leaping into new fields with giant strides—gazing with the extended vision of science into places where man has never looked

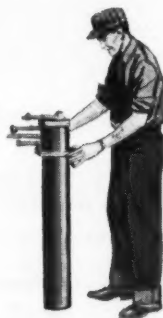
before. Strange, exciting words have crept into the language of the man on the street—cyclotron, aureomycin, gamma ray.

## But Are Process Methods Keeping the Pace?



Heating of solutions, for example, is accomplished by methods which are basically related to the teakettle whistling away on a kitchen stove. With such methods fuel bills are inordinately costly, original equipment and installations are expensive, corrosion imposes a heavy maintenance toll.

## By Contrast, Look What SUBCOMCO® Offers



A Subcomco® NOZ-L-MIX® burner like this one delivers 5,000,000 B.T.U.'s per hour.

One Subcomco® burner installed in what is little more than a bulge in the piping can do the job that would ordinarily require an expensive tank, a complete boiler installation, perhaps even an entire building to house the equipment. One \$6,000.00 Subcomco® burner, used as a chemical reactor and arranged in the manner shown at right, is used by a caustic chlorine producer at a saving of \$1,200 per month.

And this is only *one* application of Submerged Combustion equipment. There are many more. We'd like to hear from you. If you have a process where a liquid is to be subjected to heat, carbonation or a chemical reaction, let us hear from you. We'll be perfectly frank. If we can't offer you important advantages, we'll say so. If we can, we'll work with you to develop an improved process for your company.

Write for Subcomco® Application Manual



OVER A QUARTER CENTURY OF SERVICE TO AMERICAN INDUSTRY

# Submerged Combustion

COMPANY OF AMERICA, INC.

HAMMOND, INDIANA

When inquiring check CP 4882 opposite last page

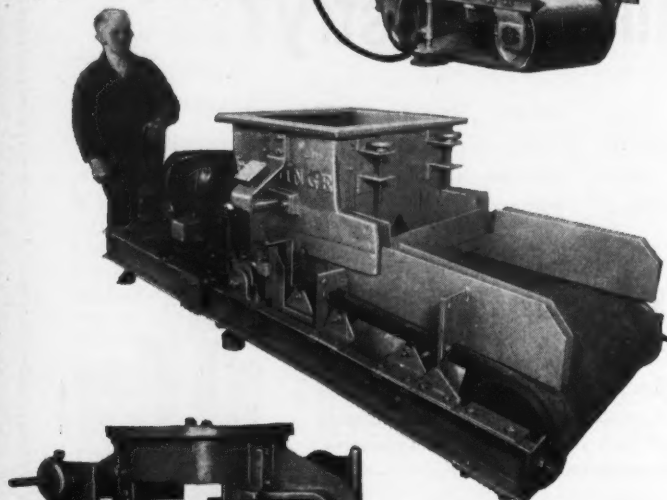
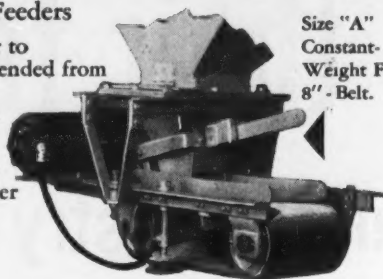
## LOW INSTALLED COST

### All HARDINGE Feeders

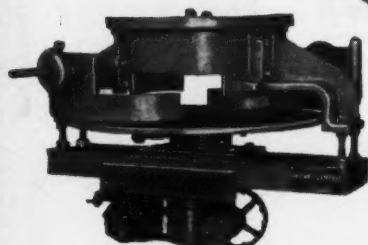
from 100 POUNDS/hour to 100 TONS/hour are suspended from the feed bin which:

- Eliminates costly feeder support structure
- Provides accessibility to equipment following feeder

Size "A" Constant-Weight Feeder, 8" - Belt.

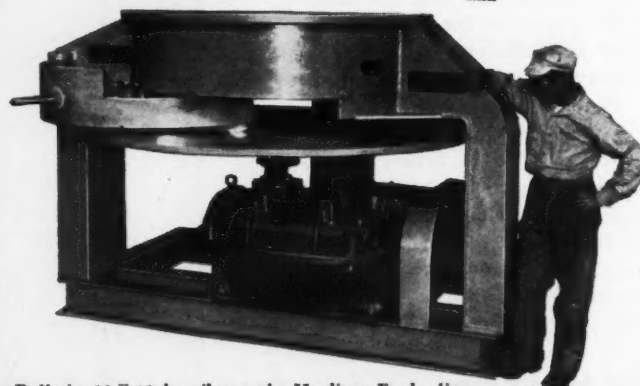


Size "D" Constant-Weight Feeder, 36" - Belt.



30" Disc Feeder

84" Disc Feeder



Bulletin 33-E-13 describes entire Hardinge Feeder line.

# HARDINGE

COMPANY, INCORPORATED

YORK, PENNSYLVANIA • 240 Arch St. • Main Office and Works  
New York • Toronto • Chicago • Hibbing • Houston • Salt Lake City • San Francisco

When inquiring check CP 4883 opposite last page

## PROCESSING EQUIPMENT

### Simple adjustment, easy cleaning features of redesigned mills . . .

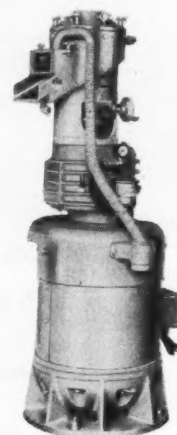
high-speed units can handle up to 7500 gal per day

**Uses:** Grinding, homogenizing, or dispersing chemicals, paints, inks, and similar materials.

**Features:** All models have handwheel adjustment with micrometer setting for simple adjustment to very fine grinds. Magnetic swirl arrestor reduces splash and removes tramp metal.

**Description:** Redesigned mills are economical to operate and require minimum attention and maintenance. Designed to operate at high speed for large-volume production, units range in capacity from 160 to 750 gal per day (8 hr). Other improvements incorporated include: built-in stop that indicates time for stone replacement, easier time-saving method for head and stone removal and replacement, and external grease fittings.

(Mills are product of Morehouse-Cowles, Inc., Dept. CP, 1150 San Fernando Road, Los Angeles 65, California . . . or for more information reader may simply check CP 4884 on form which is located opposite last page.)



Redesigned mills feature many improvements

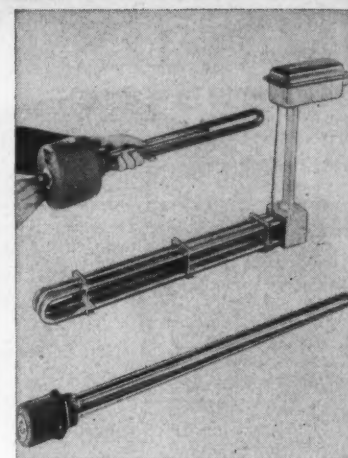
### Compact filter removes particles down to five microns . . .

uses either permanent or disposable elements

**Uses:** As polishing filters in chemical plants and for bulk filtration of petroleum products.

**Features:** Filters are available with either permanent or disposable filter elements capable of removing particles down to five microns. Complete package unit consists of filter, pressure gages, vent and drain connections, mounting legs, and filter elements.

**Description:** Standard units are available in wide range of sizes, with flow capacities from 50 to 1200 gpm. Filters withstand 150 psi and 450°F. Custom units may be manufactured in brass, stainless steel,



## CHROMALOX Electric IMMERSION HEATERS

with or without  
built-in thermostats  
... fit the heat to your need  
up to 100,000 watts  
and 2,500 psi

Full range of sizes and ratings in portable, screw-plug and flanged types. Available with copper, steel or alloy sheaths to resist corrosion.

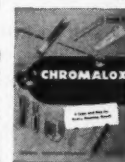
Used for heating water, asphalt, greases, molten salts, pickling and plating baths, process kettles; for superheating steam and compressed air; for melting lead, solder, babbitt; and for a wide range of similar applications.

Let the Chromalox Sales-Engineering staff solve your heating problems . . . electrically.

### Write for your copy of Catalog 50

—for full information on the complete line of Chromalox Electric Heaters and controls.

For ideas on additional applications of electric heat, request Booklet F1550—"101 Ways to Apply Electric Heat."



### Edwin L. Wiegand Company

7517 Thomas Boulevard, Pittsburgh 8, Pennsylvania

EDWIN L. WIEGAND COMPANY  
7517 Thomas Boulevard, Pittsburgh 8, Pa.  
I would like to have . . .

- ☐ a copy of Catalog 50  
☐ a copy of "101 Ways"  
☐ a Sales-Engineer contact me.

Name \_\_\_\_\_  
Company \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

A-4407A

When inquiring check CP 4885  
opposite last page

CHEMICAL PROCESSING





Filter's simple design assures easy operation, low maintenance

clad metals, aluminum, and Monel. Simple design assures easy operation and low maintenance. Laboratory facilities for testing filters for specific applications are available.

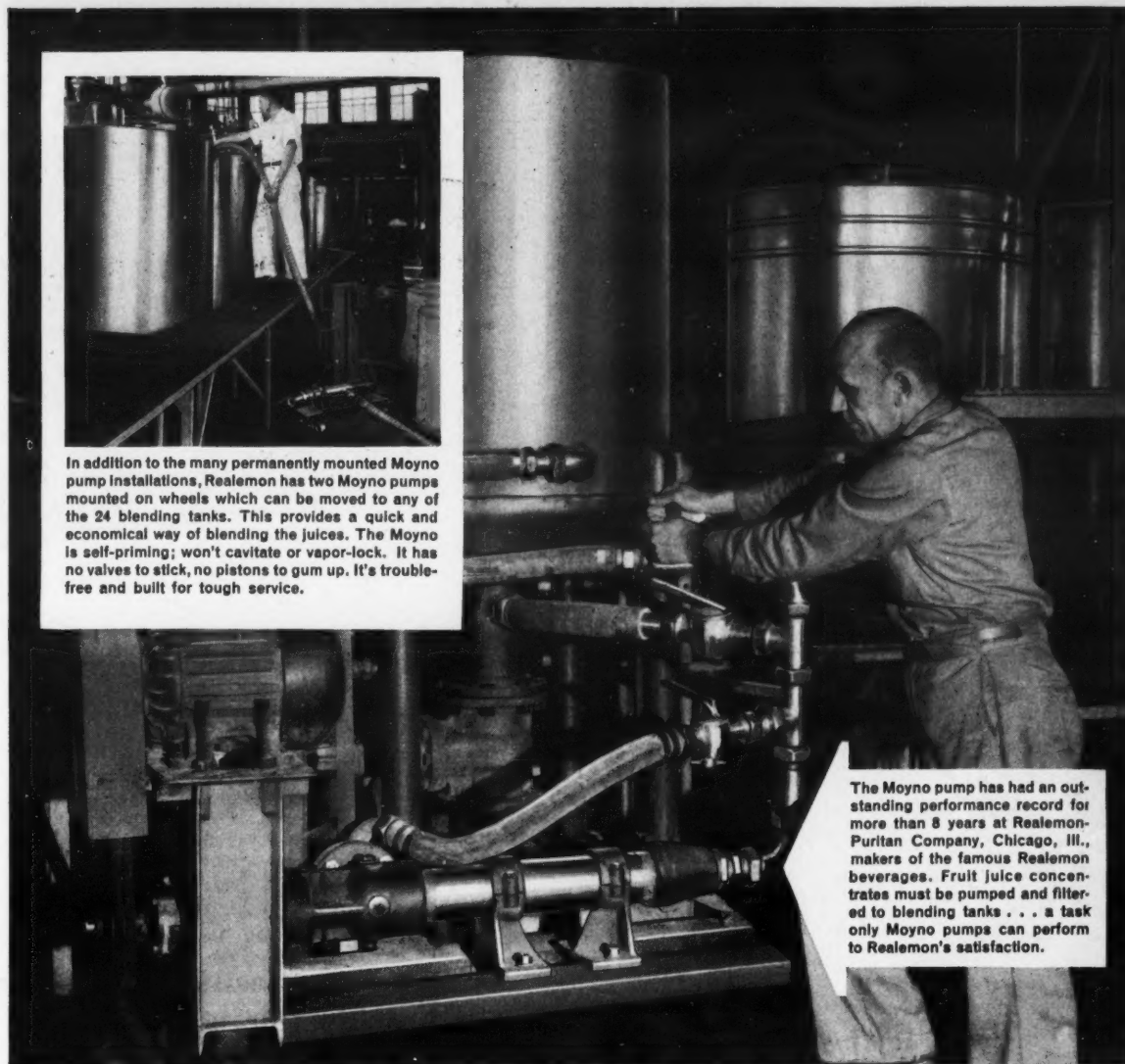
(Filters are product of Pioneer Filter Division, Komline-Sanderson Engineering Corporation, Dept. CP, Peapack, N.J. Check CP 4886 opp. last page.)



"Smith, any raise seems too small after that real sad pitch about your wife and ten kids."



In addition to the many permanently mounted Moyno pump installations, Realemon has two Moyno pumps mounted on wheels which can be moved to any of the 24 blending tanks. This provides a quick and economical way of blending the juices. The Moyno is self-priming; won't cavitate or vapor-lock. It has no valves to stick, no pistons to gum up. It's trouble-free and built for tough service.



The Moyno pump has had an outstanding performance record for more than 8 years at Realemon-Puritan Company, Chicago, Ill., makers of the famous Realemon beverages. Fruit juice concentrates must be pumped and filtered to blending tanks . . . a task only Moyno pumps can perform to Realemon's satisfaction.

## Moyno® Pump exclusive choice of Realemon engineers for pumping juice concentrates

In the preparation of many of the famous Realemon products, concentrated fruit juices often must be pumped and filtered to blending tanks.

Pumps formerly used to handle this exacting process wore out completely in a few months because of their inability to stand up under the high acids in citrus juice concentrates.

Realemon then changed to the Moyno pump. Its unique rotor and stator arrangement forms sealed progressing cavities that move the material and provide positive displacement. For this Realemon application, Moynos with chrome-plated rotors and synthetic rubber stators were selected, to assure trouble-free service and long pump life.

Moyno pumps have now been in operation at Realemon for more than eight years, with an outstanding performance record. The only maintenance required is simply to replace the rotor and stator about once a year.

Moynos regularly handle a wide variety of products that other types of pumps can't handle—products such as potato salad, chow mein, fruit, alkalis, pastes, paints, tar—even cement and plaster.

Perhaps the Moyno will solve your pumping problems, too. Write us today for complete information. Ask for a free copy of Bulletin 30-CP.

**ROBBINS & MYERS, INC.**

MOYNO PUMP  
DIVISION



Springfield, Ohio  
Brantford, Ontario

When inquiring check CP 4887 opposite last page

# SURETY SHOWS YOU How to Figure Chin to toe Protection FOR MAXIMUM SAFETY & SAVINGS



## GLOVES . . . . .

Straight or curved fingers, non-slip finishes, neoprene, rubber and exclusive Sureseal; plastic and vinyl coated fabrics. Many other styles to meet most hand protection needs.



## APRONS & SLEEVES . . . . .

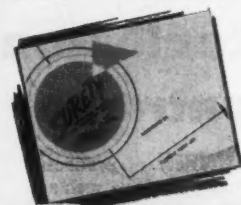
Standard and special aprons (trough types, etc.); sleeves of various styles, in all worth-while coated and synthetic materials to offer "plus" protection and comfortable wear.



## LEGGINGS & SPATS . . . . .

Surety's line of leggings, spats and special apparel is widely favored; the right material for the required service provides maximum safety at the right cost.

SEND FOR COMPLETE INFORMATIVE  
PRICE LIST TODAY



THE  
**SURETY**

RUBBER CO.  
CARROLLTON, OHIO

In Canada: Safety Supply Co., Toronto

CLIP AND MAIL COUPON FOR FREE DESCRIPTIVE PRICE LIST

The Surety Rubber Co.  
Carrollton, Ohio

Gentlemen:  
Please mail me the descriptive price lists.

Name \_\_\_\_\_ Title \_\_\_\_\_

Company Name \_\_\_\_\_

Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_

Glove Jobbers Name \_\_\_\_\_

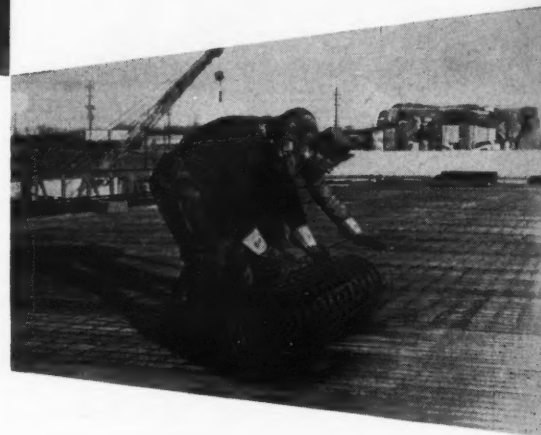
## safety



Monolithic perlite roof consists of  
an average thickness of  $2\frac{7}{8}$  inches  
of concrete . . .

. . . poured over wire mesh reinforcement . . .

. . . and supported by corrugated  
galvanized steel



Comprised of lightweight, fire-proof perlite,  
poured over corrugated steel . . .

## monolithic roof tames 1700° heat

COMBINING fire-resistance, insulation against heat, sound absorption, elasticity and resistance to moisture, non-combustible perlite may offer solution to numerous roof construction problems. Perlite, a volcanic glass rock processed to form a lightweight, white, fire-proof material, weighs about 1/12 as much as sand. Replacing sand in concrete mixture, material forms monolithic roof . . . incombustible itself and providing adequate insulation for any combustible roof finish.

Roof construction consisting of perlite-concrete deck poured over a corrugated steel base has been approved for a one-hour fire rating for Underwriters'

Laboratories. Roof deck used in the UL tests consisted of 24-gage galvanized corrugated steel, insulated with one part cement to six parts perlite (by volume) mixture of concrete. Overall thickness was  $3\frac{1}{2}$  inches — average thickness of concrete fill was  $2\frac{7}{8}$  inches. Deck was tested with bare underside exposed directly to flames. In test, lasting one hour and ten minutes, inside temperature rose to 1700°F. However, top of insulating slab never rose above 187°F. After fire and hose stream test, deck was double-loaded with 80-lb per square foot with practically no additional deflections noted.

Deck under test was supported by beams boxed with

When inquiring check CP 4888 opposite last page

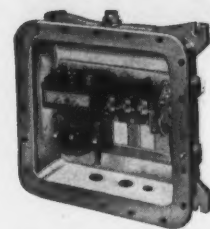
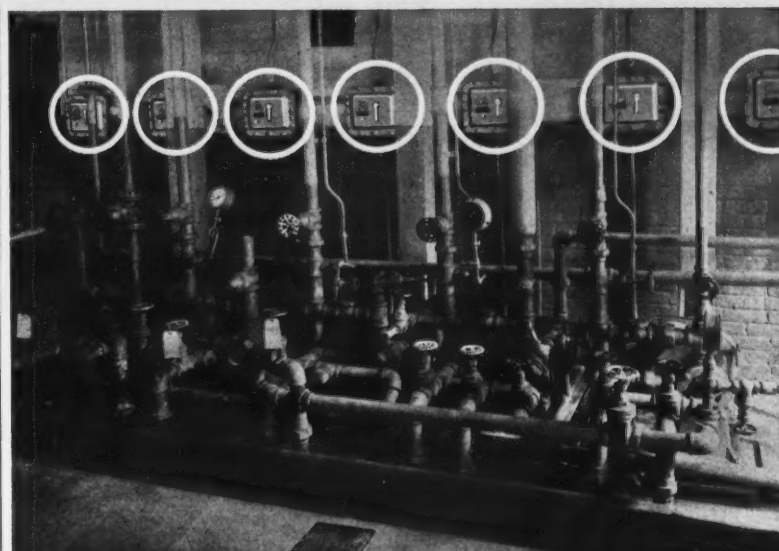




metal lath and  $\frac{7}{8}$ -inches of perlite-gypsum plaster. Temperature of beams averaged  $340^{\circ}\text{F}$  at end of an hour's exposure and calculated heat transfer coefficient of the entire assembly, including built-up roofing, was 0.17 Btu per hour/per sq ft/per  $^{\circ}\text{F}$ .

Typical construction of the perlite-cement roof is as follows: Twenty-four gage galvanized corrugated steel decking is laid on steel spans. Wire mesh (48-1214) is laid to prevent shrinkage or temperature cracking. Concrete fill is then poured to a thickness averaging  $2\frac{7}{8}$ ". Expansion joints, required in all monolithic construction, are used across each 100 lineal feet of slab. Parapet wall, skylights, or other elements piercing roof deck are surrounded by one-inch highly compressible expansion joint. In addition to safety advantages, concrete and plaster mixed with perlite aggregate save on structural steel and pouring costs because of their light weight. Concrete roof slabs adhere directly to steel of roof deck, providing greater rigidity and permanence than fiber-type insulation can give. When metal under perlite concrete is heated, tests have shown that it separates from the slab. Thus, even though the steel sags, the reinforced concrete insulation can remain in place, protecting the roof from flames and heat as long as beams or joists remain standing.

(Information on perlite concrete roof was provided by the Perlite Institute, Dept. CP, 45 W. 45th St., New York, N. Y. . . . or for more information check 4889 on form opposite last page.)



The cover has been unbolted from this Allen-Bradley combination starter to show the wide flange construction of the explosion-proof enclosure.

Left—A row of Allen-Bradley explosion-proof combination starters operating flammable solvent pumps in a penicillin plant.

## ALLEN-BRADLEY AUTOMATIC MOTOR STARTERS for Every Working Condition in the Process Industries

Allen-Bradley Bulletin 712 combination starters . . . which have the manual disconnect and Allen-Bradley solenoid starter in one cabinet . . . are mighty popular, today, with plant engineers, maintenance men, and electricians.

1—Allen-Bradley combination starters are SAFER than a separate disconnect switch and starter, because disconnect lever must be OFF before door can be opened. The solenoid starter is then "dead."

2—Bulletin 712 combination starters use a new visible contact disconnect switch—the latest development in safety for the operator.

3—They are EASIER and QUICKER to install and wire than two separate units. Installation costs less!

4—The double break, silver alloy contacts require no maintenance—a great advantage for starters with bolted covers.

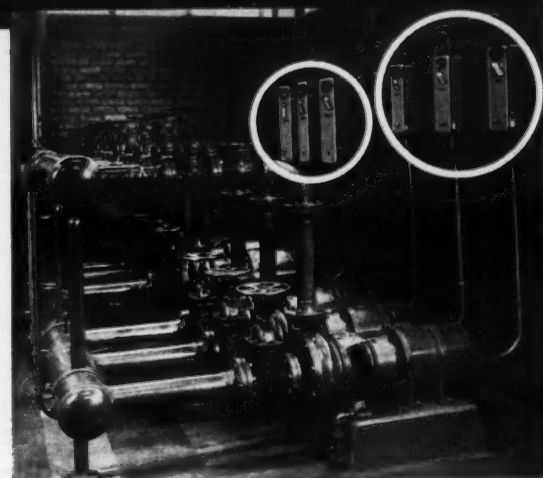
Allen-Bradley Bulletin 712 combination starters can be supplied in several types of enclosures to satisfy any working condition.

Bulletin 713 combination starters are equipped with I-T-E instantaneous trip circuit breaker in place of the manual disconnect. Send for Bulletin 712-713.

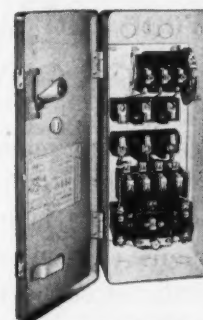
Allen-Bradley Co.

104 W. Greenfield Ave., Milwaukee 4, Wis.  
In Canada—Allen-Bradley Canada Ltd., Galt, Ont.

**ALLEN-BRADLEY**  
SOLENOID MOTOR CONTROL  
QUALITY



A row of Allen-Bradley Bulletin 712 combination starters for starting a battery of motor-driven pumps.

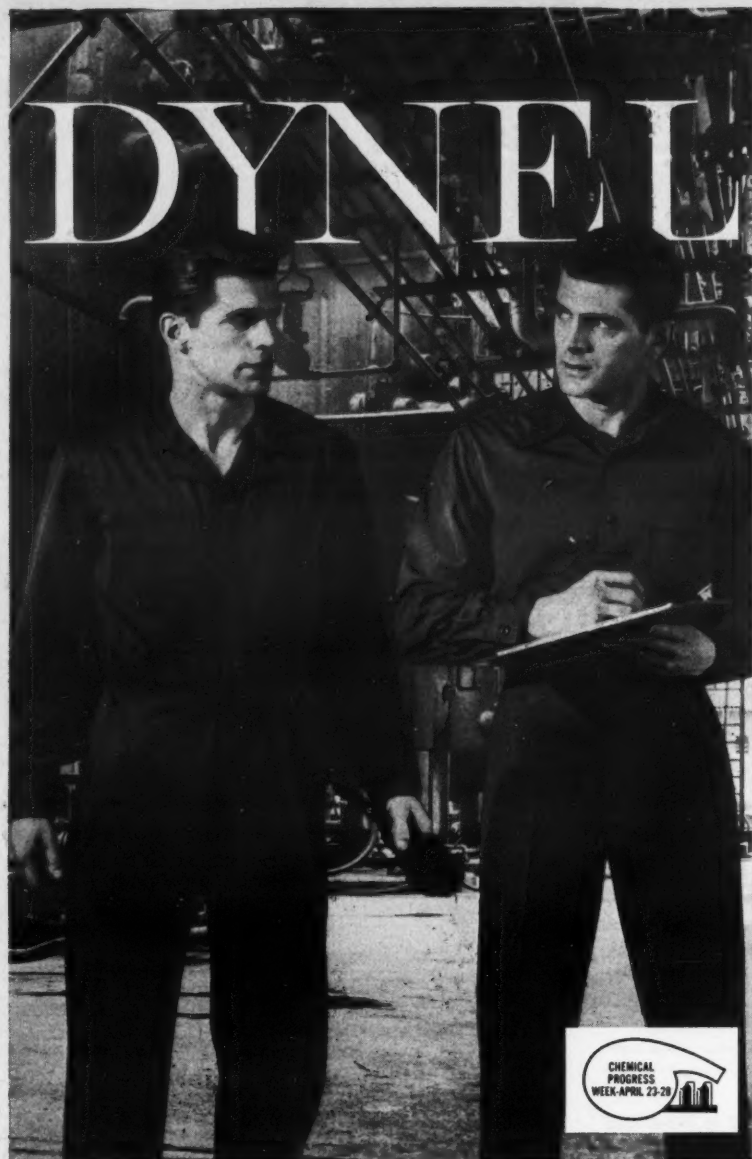


Bulletin 712 combination starter with door open to show the visible contact disconnect switch, fuse clips, and solenoid starter.



The Sign of  
**QUALITY**  
MOTOR CONTROL

When inquiring check CP 4890 opposite last page



## FOR MAXIMUM RESISTANCE to chemicals, wear and laundering IN WORK CLOTHES

Wide use proves that work clothing made of DYNEL often lasts four or five times longer than comparable garments made with traditional fibers. DYNEL is unaffected by most chemicals; can be washed, dry cleaned or decontaminated in acids without harm; will not support combustion; retains strength wet or dry. Write for list of manufacturers.

DYNEL • Union Carbide and Carbon Corporation **UCC** 30 East 42nd Street, New York 17, N. Y.

When inquiring check CP 4891 opposite last page

### SAFETY

**Allows operators to spot  
variation in temperature  
from 50 foot distance**

Thermometer has visual warning signal which tells operators, even from a distance of 50 feet, when normal temperature readings rise or fall. This is accomplished by means



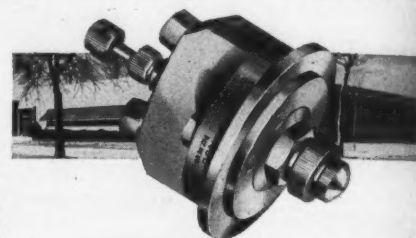
Slightest temperature variation is reported to operator by appearance of red disc. If conditions are normal disc is invisible

of a bright red disc affixed to the pointer.

An opaque disc of the same diameter is attached to the dial glass over the spot where it exactly coincides with the red disc. Slightest temperature variation causes pointer to fluctuate above or below the opaque circle, thus revealing the red signal eye to the observer.

Thermometers are available in three or five inch diameter dials and in stem lengths from 2½ up to as long as 72 inches. Fahrenheit ranges vary from -40 to +160°, with intermediate ranges and a high of 200-1000. Centigrade ranges run

to the 99 plants in 100  
*who* **use SPRAY NOZZLES**



WRITE  
FOR

In the search for doing things better and faster, have you overlooked the importance of spray nozzles? Your application may be commonplace or complex... but whatever it is, properly engineered spray nozzles can make a vast difference. Let Spraying Systems Co., America's foremost authority on industrial spray nozzles show you why and how. As a first step, write for catalog.

**SPRAYING SYSTEMS CO.**  
Engineers and Manufacturers  
3216 Randolph Street  
Bellwood, Illinois

Catalog No. 24  
Chemical and Industrial Spray Nozzles  
and Related Equipment

When inquiring check CP 4892 opposite last page

## HOW TO HANDLE DRUM FLUIDS *faster!*

### WORKS DOZENS OF WAYS!

Handiest piece of equipment in the plant! That's what they say at scores of plants where this Fast-Flo Drum Pump is used. It's a really versatile worker... has dozens of specific uses. Here are just a few ways it will work for you:

- For transferring fluids cleanly and safely from upright original drums.
- For supplying or adding fluids to production lines, direct from original drums.
- For agitation and mixing in closed drums.
- For injecting fluids such as cutting oil at high pressure.
- For intermittent spraying of lacquers, varnishes and other light coatings.

Fast-Flo is surprisingly low in cost... air-operated... easy to handle... and rugged! You get double-action, high volume, controlled delivery, wherever you use it.

Write today for the new Fast-Flo Idea Book which tells you where and how this pump can save you money.

**GRAY COMPANY, INC.**  
42 Grace Square, Minneapolis 13, Minn.



**GRACO** *Fast-Flo*  
**DRUM PUMP**

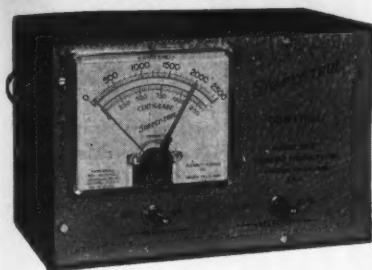
Regional Offices: New York, Philadelphia, Detroit, Atlanta, Chicago, San Francisco

When inquiring check CP 4893 opposite last page

CHEMICAL PROCESSING



## SIMPLYTROL AUTOMATIC PYROMETER



10 temperature ranges cover from -75° to 3000°F.

Several special ranges to -400°F.

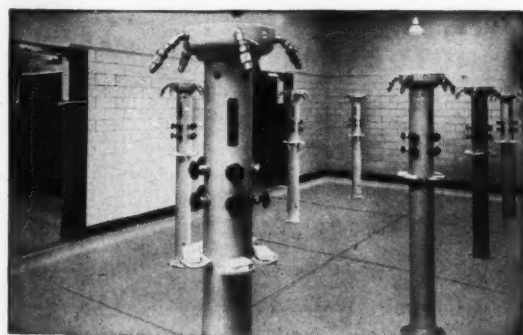
Cat No. 4531 0/2500° F.  
Price \$132.00

Thermocouple type Automatic Pyrometer for controlling temperature in furnaces, ovens, and processes. The Simplytrol is economical and reliable with few moving parts. There are no vacuum tubes. The regular load relay is S.P.D.T. 5 Amps. Optional heavy duty relays to 40 Amps.

10 temperature ranges cover from -75° to 3000° F. Several special ranges to -400° F. "On & Off" control for holding the desired temperature works on gas, oil or electric heat. Indicating meter-relay is medium high resistance and has bimetal cold junction compensation. For use with all standard thermocouples. Accuracy 2%.

"Auto-Limit" switch changes Simplytrol from automatic controller to limit pyrometer for safety shut down or warning. Cabinet: 6½x6½x9½ inches. Also flush panel mount models. Send for new Bulletin G-7 for more data. Assembly Products, Inc., Chesterland 36, Ohio.

When inquiring check CP 4894 opposite last page



Installation of 10 Column Showers, Cincinnati Chemical Co.

## THEY SELECTED BRADLEY COLUMN SHOWERS

Without the usual partitions of the 3-stall or 5-stall Bradley Showers, the Column Showers are otherwise complete with drain fittings, sprayheads, soap trays, mixing chamber for temperature control with hot and cold water control valves. Ready to install.

Floor space is saved and by placing Showers away from walls, wall water-proofing is not required and space may be used for lockers and benches.

Here's the answer to your Shower requirements at low cost. Write for Catalog 5601  
**BRADLEY WASHFOUNTAIN CO.**, 2231 W. Michigan Street, Milwaukee 1, Wisconsin.

**BRADLEY**  
*showers*  
Distributed through  
Plumbing Wholesalers

When inquiring check CP 4895 opposite last page

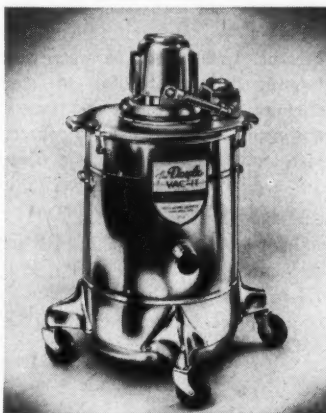
## SAFETY

from -10 to +110° and up to 0-300°. All are individually calibrated to an accuracy of 1% the full scale reading.

(Signal Eye thermometer is a product of W. C. Dillon & Co., Inc., Dept. CP, P. O. Box 3008, 14620 Keswick St., Van Nuys, Calif. . . . or for more information check CP 4896 on form opposite last page.)

### Allows explosion-proof recovery of explosive, inflammable dust

Explosion-proof vacuum provides complete safety for wet or dry recovery of explosive or inflammable dust and gases. Portable, light-



weight unit has UL approval for use under hazardous or explosive conditions: Class 1, Group D, and Class 2, Group G.

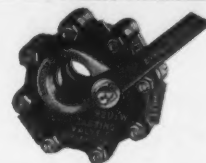
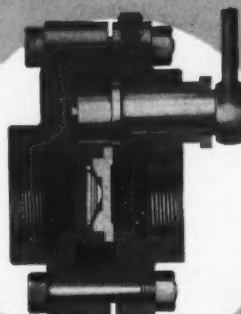
Unit has been approved for safe operation in presence of gasoline, hexane, naphtha, benzene, butane, propane, alcohols, acetone, lacquer solvent vapors or natural gas, flour, starch, and grain dusts.

Casters, bag, hose, attachments and connecting gaskets are electrically conductive so static charges are grounded. Motor, switch, and cable connections are totally enclosed; every part is explosion-proof.

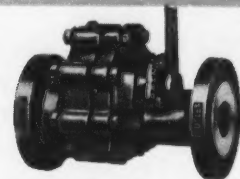
(Model HL-1 cleaner is a product of Doyle Vacuum Cleaner Co., Dept. CP, 250 Stevens St., S. W., Grand Rapids 2, Mich. . . . or for more information check CP 4897 on form opposite last page.)

## Everlasting Valves

are superior  
for many  
services



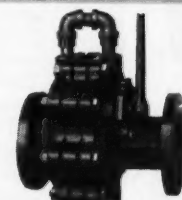
**BOILER BLOW-OFF**  
Quick acting, also handwheel operated "Y" and angle types. For pressures up to 600 psi.



**GENERAL SERVICE**  
Where drop-tight seal and full flow is essential.



**CYLINDER OPERATED**  
Can be remotely controlled, electrically or manually.



**STEAM JACKETED**  
Assures free flow of viscous materials.



**WEIGHT-OPERATED**  
For automatic drains or emergency shut off.

### When you want

- quick action
- drop-tight seal
- minimum pressure drop
- straight-through full flow
- self-grinding rotating disc
- valves that cannot wedge or jam

### then you want an Everlasting Valve

No other valve has all the Everlasting features . . . proven by half a century of service to assure dependable, leak-tight service.

LET US HELP YOU  
WITH YOUR VALVE PROBLEMS

**EVERLASTING**  
*Valves*  
**EVERLASTING VALVE CO.**  
73 FISK STREET, JERSEY CITY 5, N. J.

When inquiring check CP 4898 opposite last page

# CESCO

RIGHT...before your Eyes!



Cup-type Goggles



Chemical Goggles



Spectacle-type Goggles



Plastic Frame Goggles



Cover Goggles



Lite-Specs



Fiber Glass Helmet



Approved Respirator Hood



Face Shields



Approved Respirators

**WHATEVER TYPE OF SAFETY EQUIPMENT YOU NEED... BUY WITH CONFIDENCE from the CESCO Distributor listed here**

• You don't need to hunt for the best source of safety equipment. Take it from CESCO, you can buy with confidence from the firms listed here. CESCO has the finest type of distributor representation—the kind you want when in the market for every type of safety and protective equipment. These firms are safety specialists and well stocked with equipment that has stood the test of time in industrial plants everywhere.

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Guardian Safety Equipment Co.  
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BIRMINGHAM, ALA.  
"L. P." Harless Company  
2627 Seventh Avenue, South

BOSTON, MASS.  
General Equipment Corporation  
261 Franklin Street

BUFFALO, N. Y.  
The Watson Company  
1443 Main Street

CHICAGO, ILL.  
Universal Safety Equipment Co.  
3115 Diversey

CINCINNATI, OHIO  
Williams & Co., Inc.  
3231 Fredonia Avenue

CLEVELAND, OHIO  
Williams & Co., Inc.  
3700 Parkman Avenue

COLUMBUS, OHIO  
Williams & Co., Inc.  
801 Williams Avenue

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Guardian Safety Equipment Co.  
906 Jefferson Tower Bldg.

DETROIT, MICH.  
Averill Equipment Company  
19225 Conant Avenue

HOUSTON, TEXAS  
Guardian Safety Equipment Co.  
1915 Westheimer

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Safety, Incorporated  
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Safety Equipment Distributing Co.  
832 W. Main Avenue

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1114 W. Main Street

LOS ANGELES, CALIF.  
Guardian Safety Equipment Co.  
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LOUISVILLE, KENTUCKY  
Williams & Co., Inc.  
1109 S. Preston Street

MILWAUKEE, WIS.  
Universal Safety Equipment Co.  
3155 S. 7th Street

ORANGE, N. J.  
Guardian Safety Equipment Co.  
400 S. Jefferson Street  
(New York-New Jersey Area)

PEORIA, ILL.  
Universal Safety Equipment Co.  
118 S. Garfield

PHILADELPHIA, PA.  
Guardian Safety Equipment Co.  
214 S. 45th Street

PITTSBURGH, PA.  
Williams & Co., Inc.  
901 Pennsylvania Avenue

ST. LOUIS, MO.  
Safety, Inc.  
2608 Olive Street

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Continental Safety Equipment, Inc.  
1551 Selby Ave.

SALT LAKE CITY, UTAH  
Universal Fire & Safety  
Equipment Co., Box 1587

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MEXICO CITY, D. F.  
Safety Equipment S. A.  
Sullivan-95

MONTREAL, CANADA  
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You can buy with confidence from CESCO distributors

CHICAGO EYE SHIELD COMPANY  
2316 Warren Boulevard  
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**CESCO**



FOR SAFETY

## SAFETY

**Shoes are waterproof but still "breathe"**

Leather safety shoes are treated in tanning stage with Dow Corning "Sylflex" to waterproof them, at the same time allowing shoes to



Silicone-tanned safety shoe

breathe. In addition to water, the tanning allows leather to stop chemical, oil, bleach, and caustic absorption. Shoes have neoprene soles and Dacron stitching. They are available in both oxford and high styles.

(Shoes are a product of the Record Industrial Co., Dept. CP, 3301 Arch St., Philadelphia 4, Pa. . . or for more information check CP 4900 on form opposite last page.)

**Data on safe handling of benzene**

Booklet of 20 pages covers properties and essential information for safe handling and use of benzene. Booklet is second revision of data sheet since adopted in 1946. Properties, both physical and chemical, of benzene are given. Material is given on containers, unloading and emptying containers, storage, handling—including protective equipment, waste disposal, health hazards and their control.

To obtain "Chemical Safety Data Sheet SD-2, Benzene" remit 30c direct to Manufacturing Chemists' Association, Inc., 1625 Eye St., Northwest, Washington 6, D. C.

# AT LAST!

A HIGH-PRESSURE SWING CHECK VALVE THAT DOES NOT "KNOCK" OR "CHATTER"

• This revolutionary GREENWOOD Valve gives you all of the advantages of the swing-check type valve without the disadvantages of "knocking" or "chattering." The self-aligning swing gate opens like a door rather than riding on top of the fluid flow. Handles oil, gas, steam, water, etc. Write for full details today.

**LESS VALVE WEAR MEANS LONGER VALVE LIFE**

Furnished in high pressure cast steel for working pressures of Series 150, 300 and 600. Sizes 2" thru 12".



PATENTED



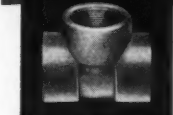
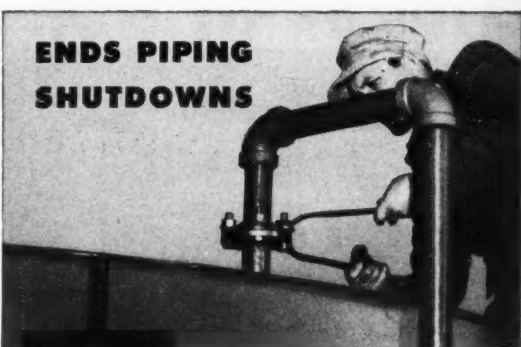
# GREENWOOD

Manufactured by  
GREENWOOD VALVE DIVISION  
VERNON TOOL CO., LTD.

VERTICAL SWING  
HORIZONTAL  
CHECK VALVES

1101 MERIDIAN AVE.  
ALHAMBRA, CALIFORNIA

When inquiring check CP 4901 opposite last page



**This PVC piping — with injection molded fittings—lasts and lasts**

At this plant, unplasticized PVC piping handles sulfuric, nitric, muriatic, phosphoric, and acetic acids. Pressures range to 100 psi. This PVC piping, using Tube Turns Plastics' injection molded PVC fittings, has been in service for months, shows no signs of deterioration. Yet the metal and alloy metal piping it replaced failed at 3 to 12 months intervals from corrosive action. Cut your maintenance—eliminate shutdowns and hazards. Write for free booklet describing properties of unplasticized PVC fittings and flanges. Tube Turns Plastics, Inc., Dept. PA-4, 2929 Magazine Street, Louisville 11, Kentucky.



**TUBE TURNS PLASTICS, INC.**

Louisville 11, Kentucky

Call your TUBE TURNS PLASTICS' Distributor

When inquiring check CP 4902 opposite last page

CHEMICAL PROCESSING

When inquiring check CP 4899 opposite last page



*We challenge you*  
to find better  
**PROTECTIVE CLOTHING!**



Toughest by Test  
PROG BRAND®

illustrated  
above:  
¾ length  
coat

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For every industry where personnel protection and safety are vital, only Sawyer Neoprene Latex Clothing offers all these advantages:

- 100% protection against oils, chemicals, alkalies, abrasion — and other hazards!
- "Exclusive Coating Process" . . . (for years and years of extra wear and durability) — original with Sawyer!
- guaranteed not to peel, blister or crack in ordinary usage!
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- solid brass or non-conductive fastenings that can't rip off or corrode!
- designed for roomy, action-free comfort!

Sawyer clothing also Rubberized or Oiled. Full range of jackets, pants, coats, hats, aprons for more efficiency, more economy, more protection on every job!

*Make us prove it!*

Send for complete details and price list.  
**The H. M. Sawyer & Son Company**

A Division of Sawyer-Tower, Inc.  
Specialists in Protective Clothing for more than a century  
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When inquiring check CP 4903  
opposite last page

**SAFETY**

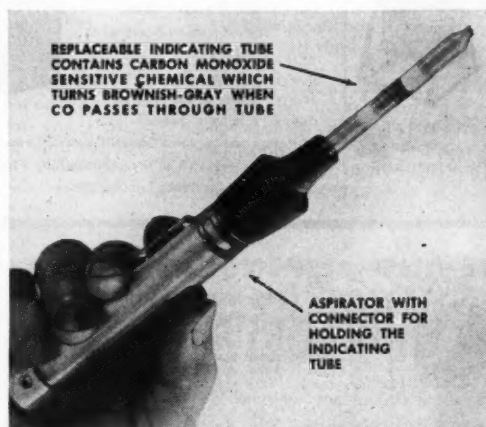
**Pencil-sized detector  
indicates three levels  
of CO concentration**

Senses as little as 40 parts CO per million parts of air

**Uses:** Pencil-size detector shows presence of carbon monoxide in any concentration dangerous for occasional, short-time, or long exposure. Instrument is useful as "safety check" on CO hazards in garages, mines, or other areas where gas appliances are installed.

**Features:** Unit, sensitive to concentrations as low as 40 parts CO per million parts of air, requires no color matching or reference to a comparator scale.

**Description:** Tester comprises replaceable indicating tube and aspirator pump with connector for holding tube during test. Indicator is glass tube containing CO sensitive chemical which turns brownish-gray as carbon monoxide passes through tube. Air is drawn through tube by depressing

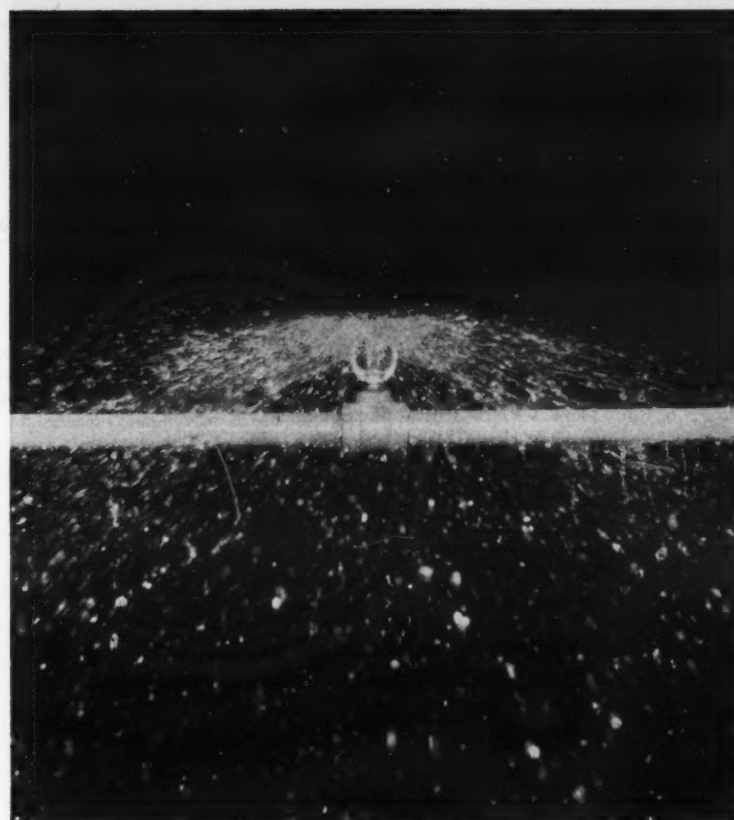


Pencil-sized detector indicates CO concentrations in any area where gas appliances might be used

button in center of pump barrel. If chemical shows stain the CO concentration exceeds limit allowable for short time exposure. If no stain is noted, a second pump stroke is taken.

Appearance of stain after second stroke indicates a concentration safe only for short periods. No staining after second pump stroke is indication that there is no hazardous concentration.

(Monoxor tester is product of Bacharach Industrial Instrument Co., Dept. CP, 7301 Penn Ave., Pittsburgh 8, Pa. . . or for more information about manufacturer's product, reader may simply check CP 4904 on the convenient Reader Service slip which is located opposite last page.)



**Fire Safety In Action . . .**



You're looking at an "Automatic" SPRAY Sprinkler an instant after fire has triggered it into action. The deluge of water will snuff out a blaze before it has a chance to gain headway. Millions of these ingenious devices provide a 24-hour-a-day fire watch in tens of thousands of industrial, commercial and institutional buildings throughout the land.

You, too, should let "Automatic" Sprinklers serve as your personal fire department. They will afford you the best practical measure of fire safety with the least effort, expense and interference with your business operation.

Complete descriptive literature now available.  
For data on "Automatic" Sprinkler systems, write for Bulletin 66.  
For data on SPECIAL HAZARD Fire Protection, write for Bulletin 73.

**"Automatic" Sprinkler**

**CORPORATION OF AMERICA**  
YOUNGSTOWN, OHIO

Offices In Principal Cities of North and South America

When inquiring check CP 4905 opposite last page

## SAFETY

### Fire protection, warning subject of film

Running 13½ minutes, film shows how typical home and small building fires develop. It also points to eight major reasons why fire breaks out once every 28 seconds.

Film also describes a warning device actuated by fire itself. No electrical connections or services are required.

For descriptive literature and details of procuring the film "Sneak Attack" contact Falcon Alarm Co., Inc., Dept. CP, 243 Broad St., Summit, N.J. When inquiring about manufacturer's product, reader may simply specify CP 4906 on form opposite last page.

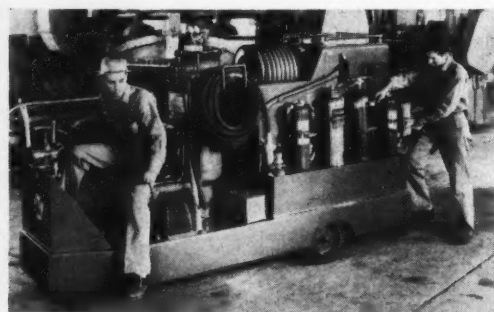
### Four types of fire-fighting gear available on in-plant fire trucks . . .

units are gasoline powered, available in three- or four-wheeled models

**Uses:** Line of easily maneuverable in-plant fire trucks was designed to operate in tightly confined areas.

**Features:** Trucks, on either three- or four-wheeled chassis, are available with four types of fire-fighting equipment.

**Description:** Systems available include dry chemical-water fog, dry chemical-carbon dioxide, water fog-carbon dioxide and solely water. Accessories include ladders, utility bar, light, hose, portable fire extinguishers and extra nozzles, all



Fire truck is available in three- or four-wheeled models

Accessory cabinet on truck provides adequate storage room for fire blankets, boots, air masks, mounted with panic-proof, quick release brackets, first-aid kits.

Dry chemical unit comes equipped with 100 feet of hose and a Dualstream nozzle. Pump of the 150 gallon water fog system is driven through power take-off by 14 hp engine which powers

## Protectoseal — the one complete source of approved equipment for all flammable operations—PRODUCTION—STORAGE—DISPENSING

### CHEMICAL LABORATORY AND PRODUCTION EQUIPMENT

#### LABORATORY SHELF CAN

Oval shape requires far less shelf space and makes for easier handling. Four Protectoseal Shelf Cans can be placed in the same area formerly required for three ordinary round cans. Easily grasped and used with one hand. Sturdy electrically seam welded construction with perforated metal double-wall flame arrester in spout to prevent ignition from external sources. Self-closing cap with ball and socket seals against evaporation and provides pressure relief. 1 gallon capacity. Supplied in terne plate or Type 316 stainless steel to minimize contamination of contents. Approved by Factory Mutual Fire Insurance Laboratories.



#### LABORATORY DISPOSAL CAN

Provides a safe, convenient and correct method of disposing of flammable and many corrosive liquids. Large spout has 3½" inside diameter opening for use without a funnel and spring mounted cap can be locked open to empty beakers, test tubes, at arm length to avoid toxic fumes. Heavy stainless steel seam welded reinforced body has perforated metal double-wall flame arrester at base of spout to prevent interior ignition. Spring cap on ball and socket joint closes automatically to prevent evaporation and leakage and provide automatic pressure relief. Wide, squeeze-grip handle; positive pouring control; 2-gallon and 5-gallon capacities. Also available in terne plate.



#### LABORATORY CAN WITH TILT FRAME

Quick, convenient dispensing with accurate, dripless pouring. Pivots properly positioned to compel can to return to vertical position upon release, yet permit tilting forward with minimum effort. Faucet and filler openings have perforated metal double-wall flame arresters to prevent ignition of contents. Self-closing spring actuated closures; quick shut-off faucet with press-down lever. Electric seam welded heavy terne plate container with sturdy welded strap iron frame. 5 gallon capacity.



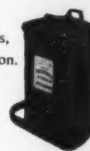
#### FIRE PROTECTIVE WASH TANK

For manual washing of test tubes, beakers and equipment. Square shape with rounded corners gives stability and smooth interior; "unit" construction of heavy terne plate electrically seam welded; top edge deep-flanged for extra strength and protection of user. Top has full-length hinge to prevent distortion and contains fusible link which drops cover automatically in case of fire. Approved by Factory Mutual Fire Insurance Laboratories.



#### SELF-CLOSING OILY WASTE CAN

Provides for safe disposal of oily waste and other flammable materials, and prevents spontaneous combustion. Sturdy, electric seam welded body has smooth interior and raised, ventilated bottom. Full-width treadle opens hinged top with only slight foot pressure. Double linkage top opening action is quick and positive. Sturdy electric seam welded "unit" construction. Approved by Underwriters' Laboratories and Factory Mutual Fire Insurance Laboratories.



### DRUM STORAGE AND DISPENSING

#### DRUM BUNG FITTINGS

Guards against drum explosion and rupture from vapor pressure within drum—permits smooth, even withdrawal of liquid. Perforated metal fire baffle prevents exterior fire from entering drum, and fitting provides automatic pressure relief for safe storage and dispensing in yard or vault.



#### SELF-CLOSING FIRE PREVENTIVE FAUCET with Flame Arrester and Flexible Metal Hose Attachment.

Lever-type handle opens faucet only when attendant is present; sturdy, fatigue-resisting spring within body keeps a tight closure at all times. Perforated brass cylinder flame arrester in outer end of faucet prevents entrance of fire and acts as strainer; easily removed for cleaning. Faucets fit standard ¾" drum bung openings and are supplied with choice of gasket materials. Flexible metal hose attachment with metal flame arrester available in 6', 12' and 18' lengths.



#### SAFETY TRANSFER PUMP

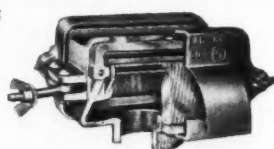
Tested and approved by Underwriters' Laboratories and Factory Mutual, the Protectoseal pump is designed for complete safety in the hazardous transfer of flammables from drums to use containers. Three built-in fire baffles at critical points: at the spout, above the bung adapter and at the strainer inlet within the drum. Static-proof hose. Fast shut-off provides measured pumping.



### STORAGE TANK VENTING—FOR FIRE PROTECTION AND VAPOR CONTROL

#### NON-CONSERVATION TYPE VENTS WITH FLAME ARRESTERS

Provide maximum air-flow consistent with operating efficiency, positive fire protection and effective, low-cost maintenance. Light-weight, pressure-tight housings meet hydrostatic tests by Underwriters Laboratories and combine ease of installation with durability. Sturdy Protectoseal rectangular plate type flame arrester protects tank contents from propagation of fire and explosion within tank. Modern swing bolt design permits quick removal of vent covers and weatherhood for inspection or cleaning.



#### VAPOR CONSERVATION TYPE VENTS WITH FLAME ARRESTERS

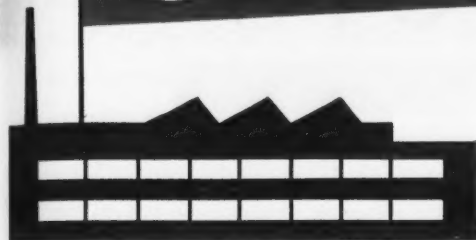
Similar in design to Non-Conservation Type Vents but incorporate pressure and vacuum relief valves in the vent housing which conserve vapors to reduce costly evaporation costs. Valves retard intake of air and escape of vapors as tank normally breathes in and out. Flame Arrester plates are easily accessible for cleaning without disturbing original factory alignment.







# PROTECTOSEAL PRODUCTS PROTECT YOUR PLANT!



**...from hazardous, flammable liquids all through the plant... speed production... conserve liquids... reduce non-productive time.**

## OVAL 1-GALLON STORAGE AND DISPENSING CAN

### SPACE SAVER FOR QUANTITY STORAGE

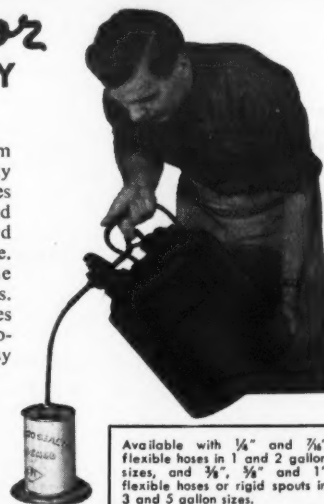
Oval shape requires far less shelf space and makes for easier handling...four cans now stored in the same area formerly required for three ordinary cans.



The long, thin, flexible spout facilitates direct filling of receptacles with small fill openings. Seam welded "unit" construction with perforated metal fire baffle in spout. Pouring controlled by squeeze-grip handle that actuates release valve and vent. Perforated double-wall metal fire baffle also protects filler opening. Available with  $\frac{1}{4}$ " and  $\frac{3}{8}$ " flexible hose.

## STOR'POZ DOUBLE DUTY DISPENSER

Now, store and pour from this combination safety and supply can—provides safe storage and controlled pouring without hazard and loss through spillage. Save expense—use one container for both jobs. Underwriters' Laboratories and Factory Mutual Laboratories approved. Easy working valve at base of flexible spout is operated by carrying hand and gives positive, spill-proof control when pouring.



Available with  $\frac{1}{4}$ " and  $\frac{3}{8}$ " flexible hoses in 1 and 2 gallon sizes, and  $\frac{3}{8}$ ",  $\frac{1}{2}$ " and 1" flexible hoses or rigid spouts in 3 and 5 gallon sizes.

## SAFETY STORAGE CABINET

### SAFE SPOTS FLAMMABLES IN STORAGE AREAS

Convenient at-the-job cabinets which save dispensing time, avoid scattering dangerous flammables through out the plant and aid enforcement of regulations that all flammable must be stored and returned to controlled storage points. Designed and built in accordance with recommendations of the National Fire Protection Association, these cabinets enable the storage of up to 45 gallons of flammables within plant departments. Cabinet is of sturdy steel construction with  $1\frac{1}{2}$ " air space between walls, non-sparking closure contact points and provision for vapor venting.



## MAIL TODAY

Fill in coupon and attach to company letterhead for NEW Guide Chart of Fire Preventive Equipment for the safe storage, handling and use of flammable liquids in laboratory and plant, and Guide Chart of Tank Vents, Fittings and Accessories for fire prevention and vapor control of storage and process tanks.

West Coast Warehouse—Los Angeles, Calif.  
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THE PROTECTOSEAL COMPANY  
1932 So. Western Ave., Chicago 8, Illinois

SEND GUIDE CHARTS OF FIRE PREVENTIVE AND VAPOR CONTROL EQUIPMENT FOR THE SAFE, STORAGE AND USE OF FLAMMABLE LIQUIDS IN LABORATORY, PLANT AND YARD. ALSO SEND THE COMPLETE CATALOGS CHECKED BELOW:

- |  |   |
|--|---|
| <input type="checkbox"/> Laboratory Equipment Catalog        | <input type="checkbox"/> Safety Can Catalog                                     |
| <input type="checkbox"/> Drum Storage and Dispensing Catalog | <input type="checkbox"/> Venting Fundamentals and Storage Tank Fittings Catalog |

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

truck. This makes possible 300 psi for fog making and delivers 16 gpm.

Three-wheeled unit, 42" wide, is suitable for in-plant use while the four-wheeled, 48" chassis is for indoor-outdoor use.

(Trucks are distributed by Ansul Chemical Co., Dept. CP, Stanton St., Marinette, Wis. . . . or for more information check CP 4908 on form opposite last page.)

### Covers safe handling and use of hydrogen peroxide

Booklet of 20 pages covers safe handling and use of hydrogen peroxide. Material is included on shipping containers, storage, waste disposal, health hazards and their control. Important physical and chemical properties of hydrogen peroxide are given. Identification of containers and labelling is also covered. Respiratory and protective equipment is specified.

To obtain "Chemical Safety Data Sheet SD-53, Hydrogen Peroxide" remit 30c direct to Manufacturing Chemists' Association, Inc., 1625 Eye St., Northwest, Washington 6, D.C.

### Explains two basic types of respirators

Printed in two colors, four-page bulletin explains differences between basic types of respirators and shows auxiliary equipment used with them.

Bul 1009-8 is issued by Mine Safety Appliances Co., Dept. CP, 201 N. Braddock Ave., Pittsburgh 8, Pa. When inquiring about manufacturer's bulletin, reader may simply check CP 4909 on form opposite last page.



Don't be old-fashioned—wear SAFETY SHOES

Cartoon is reproduction of National Safety Council poster 0554-A. For information write National Safety Council, Dept. CP, 425 N. Michigan Ave., Chicago, Ill.

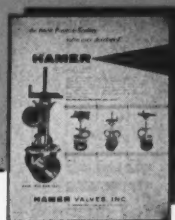
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Bulletin >>>

HAMER VALVES, INC.  
Box 1851, Long Beach 1, California

Please send immediately a copy of your new Visible Wedge Bulletin.

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Company \_\_\_\_\_  
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City \_\_\_\_\_ State \_\_\_\_\_ 1



A valve without equal

### New SURE-SEAL SHUT-OFF

Combining precision metal-to-metal fit of wedge and seats augmented by dependable seal rings, the new Visible Wedge provides the impenetrable sealing action of a Line Blind, yet maintains the simplicity of operation found in a gate valve.

The new Hamer Visible Wedge is available in Straightway, Tee, and Ell styles meeting all A.S.A. specifications.

## New Hamer VISIBLE WEDGE

The finest positive  
sealing valve  
ever developed



### New STABILITY

Hamer Visible Wedge Valves are absolutely rigid. No line movement necessary to open or close valve.



### New SIMPLICITY

"Full-view" wedge. One glance determines whether line is full open or full close.



### New SAFETY

Operator has complete control of the wedge at all times. Wedge pivots—no hand lifting necessary.

**Hamer**

**VALVES, INC.**

2919 Gardenia Ave., Long Beach 6, California  
Representatives Throughout the World.

When inquiring check CP 4910 opposite last page

# briefs

from contemporary publications

## Product diversification

The following aspects of diversification of a product line are developed: product and profit insurance, spreading risks, planning growth, engineering economics, and appraisal of product proposals. Two case studies are included. Six pages. ("Machine Design," December, 1955, page 142.)

## Fume collection

Results of an investigation of methods of fume collection over ferroalloy furnaces are presented. Topics include cleaning requirements, particle size, chemical composition, wet studies, and dry studies. Nine pages, six tables, five figures, four references. ("Journal of Metals," December, 1955, page 1327.)

## Aluminum electrolytes

Liquidus curves are given for aluminum cell electrolytes where the binary systems are cryolite-alumina with sodium fluoride, sodium chloride, and aluminum fluoride. Diagrams for three ternary systems are included. Three pages, six figures, six references. ("Journal of the Electrochemical Society," December, 1955, page 690.)

## Disposal of wastes

Disposal of pharmaceutical wastes when volumes are greater than capacity is discussed. Some aspects are reduction and elimination of wastes, methods of treatment, underground disposal, sludge disposal, and water conservation. Five pages, three figures, nine photographs. ("Industry and Power," December, 1955, page 35.)

## Impure ozone

Ozone from air seldom contains more than five per cent of nitrogen oxide impurities. Such impurities are not important toxicologically. Four pages, one table, four figures, 35 references. ("Industrial and Engineering Chemistry," January, 1956, page 115.)

## Solar energy

Reports and abstracts of papers that deal with applications of solar energy, which is now used for heating, cooling, and for electric and motive power, are presented. Four pages, one figure. ("Air Conditioning, Heating, and Ventilating," December, 1955, page 73.)

## Granular fertilizer

The Swift process for producing granular mixed fertilizer is described. Equipment, formulations, production rates, operating costs, investment and material costs are covered. Five pages, four tables. ("Agricultural Chemicals," January 1956, page 35.)

## Maintenance performance

Suggestions for measuring maintenance performance are given. New goals can be established and progress can be judged. Planning, work load, costs, and productivity are considered. Six pages, seven figures. ("Factory," January, 1956, page 81.)

## Designing pipelines

Stepwise design of safe, economical pipelines for gases is illustrated. Considered are



**abstracts of pertinent articles in other industrial publications . . . selected by CP editors as a service to you . . .**

pipeline-flow and design-pressure equations, power requirements, equivalent lengths, and specifications. Sample calculations are given. Four pages. ("Oil and Gas Journal," December 12, 1955, page 106.)

**Industrial fibers**

This manual of industrial textile fibers deals with properties, characteristics, and applications of mineral, inorganic, natural, and man-made materials. An engineering approach is employed. Sixteen pages, four tables, five photographs. ("Materials and Methods," December, 1955, page 119.)

**Corrosion of aluminum**

Practical corrosion behavior of aluminum is considered. Covered also are preventive measures, atmospheric performance of anodized aluminum, and corrosion of brazed and welded joints. Eleven pages, three tables, four figures, 29 references. ("Corrosion," December, 1955, page 54.)

**Hydraulic transportation**

Hydraulic transportation of solids in pipelines is discussed. Covered are flow of solid-liquid mixtures, effect of pipe surface, characteristics of the system, methods of pumping solids, and abrasion. Five pages, two tables, seven figures, 10 references. ("Rock Products," December, 1955, page 114.)

**Impurities in alloys**

This survey article covers effects, detection, and removal of aluminum, tin, antimony, iron, lead, nickel, phosphorus, manganese,

silicon, sulfur, and zinc as impurities in copper-base alloys. Ten pages, two tables, four figures, 47 references. ("Foundry," December, 1955, page 98.)

**Installing plastic pipe**

Polyvinyl chloride plastic pipe can be installed underground or overhead. Solvent cementing, heat welding, threading, and adhesive action are employed to attach fittings. Two pages, one table, one figure. ("Heating, Piping, and Air Conditioning," December, 1955, page 112.)

**Cotton crushproofing**

Theory, chemistry, and application of crushproofing to cotton fabrics are expounded. Covered are reactions of cotton fibers to resin finishes, chemicals used, and tips on how to apply finishes. Sixteen pages, six tables, four figures, 21 references. ("Textile World," December, 1955, page 102.)

**TiCl<sub>4</sub>**

Covered are history of production and purification of TiCl<sub>4</sub>, thermodynamics and kinetics of production by chlorination of TiO<sub>2</sub>, and problems in the purification and chlorination steps. Five pages, three tables, three figures, 23 references. ("Journal of Metals," November 1955, page 1189.)

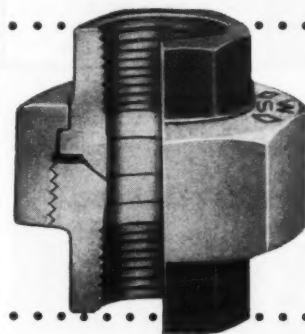
**Fuel oil quality**

For the processor of fuel oil, solutions to problems imposed by sludge and mercaptide gel are indicated. Five pages, five tables, three figures, two references. ("Petroleum Processing," January, 1956, page 67.)

**W-S FORGED STEEL UNIONS...**



These Features are  
**YOUR GUARANTEE** of a Safe,  
Tight Union Connection:



1. FORGED STEEL CONSTRUCTION—  
ASTM A-105, GRADE 2
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W-S Forged Steel Unions give you the kind of protection you need in high pressure piping systems. They're designed with precision-machined spherical-to-angle mating surfaces for positive seating, free from leaks even when pipes are slightly out of line. Cadmium-plated nuts resist galling and seizing and forged steel construction gives you the extra strength you need in high pressure service.

W-S Unions are available in 3000 lb. class, sizes 1/8" to 3" in screw-end and socket-welding types. Send today for your copy of Bulletin U-1.



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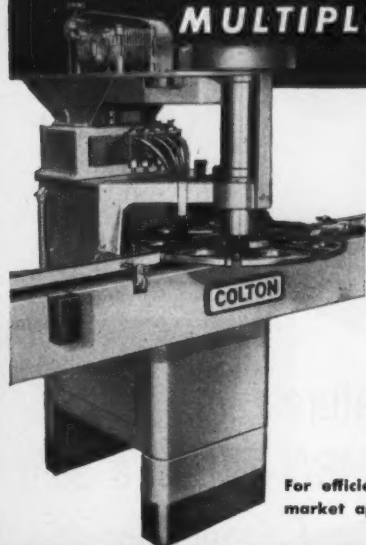


**W-S FITTINGS DIVISION**

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When inquiring check CP 4911 opposite last page

## WORLD'S FASTEST, MOST ACCURATE, MOST VERSATILE MULTIPLE LIQUID FILLER



1. Up to 480 containers a minute
2. Accurate to less than 1%
3. Fills any liquid, alcohol to cream oil
4. Completely adjustable in every respect
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6. Nozzles adjustable for container height and width
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8. No container—no fill
9. Special adaptations available
10. Quick disassembly for sterilizing
11. Completely automatic

For efficiency, performance, economy, nothing on the market approaches this Colton No. 124-126-128-132.

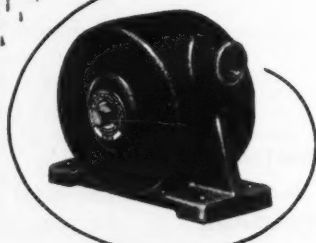
**ARTHUR COLTON COMPANY**  
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DETROIT 7, MICHIGAN

When inquiring check CP 4912 opposite last page

## EFFECTIVE, ALL-DIRECTIONAL VIBROLATION MOVES GRANULAR OR WET MATERIAL NOISELESSLY

The simplest, most quiet answer for moving materials in hoppers, chutes and bins. One moving part, no lubrication, no maintenance, never harms the equipment on which it is mounted. Instantly self-starting every time. Vibrolator is the only vibrator that can guarantee this regardless of operating conditions. Write for catalog. You will also receive form for describing your problem. No obligation!



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When inquiring check CP 4913 opposite last page

## packaging



Photos by CP Staff

With the advent of dry-charge automobile batteries, need was felt for an inexpensive, expendable container for electrolyte. Research by Scholle Northlake Corp. resulted in its being able to ...

Eight 1½-quart containers are shipped in carton meeting ICC requirements

Package consists of double-walled polyethylene bag contained in Kraft carton

Container is opened by snipping corner of plastic "pillow". Bag collapses as material is emptied, preventing surging



## ship sulfuric acid in polyethylene bags

**BILL SCHREMP**, Assistant Editor  
With **WILLIAM SCHOLLE**, President  
Scholle Northlake Corporation  
Northlake, Illinois

With the development of the dry-charge automobile batteries filled with electrolyte at time of sale, need was felt for disposable, inexpensive sulfuric acid containers. Batteries are bought and stored by dealer without electrolyte, eliminating need for charging while in storage and assuring customer a fresh battery when it is installed in his automobile. However, battery-sized quantities of sulfuric acid had to be made available to dealers.

Besides normal considerations of weight, cost, and dependability, certain safety fac-

tors were involved in package design. Used containers were likely to be thrown into a trash can, later perhaps be picked up by children or others unaware of the presence of dangerous acid. And so effort was made to find an inexpensive, dependable yet disposable container — hardly a simple task when working with something as mean as sulfuric acid.

Result of the search was a Kraft and polyethylene carton, holding 1½ quarts of electrolyte. Acid is contained in double-walled bag of four-mil polyethylene —

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container

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welded at all seams. "Pillow" package of acid is in turn contained in solid Kraft carton. Eight individual containers are shipped in corrugated box. Shipping container meets ICC 12-B shipping requirements.

New packages have been successful in all respects. A one-month check showed 0.026 percent leakers in an average of 700 miles of travel. Three-gallon carton takes up 900 cubic inches of shipping space as opposed to 2300 cubic inches for a similar quantity in glass bottles. Similarly, the Kraft-plastic package saves more than 30% in weight with cost about 2/3 that of glass. Package was met with favor by consumers. User's breakage and disposal problems have been eliminated — manufacturer recommends that used packages be burned.

Package's manufacturer feels that container is applicable to other materials and has been approached by various manufacturers for a licensing arrangement. Among other products under consideration are anti-freeze, lubricating oil, and some food products.

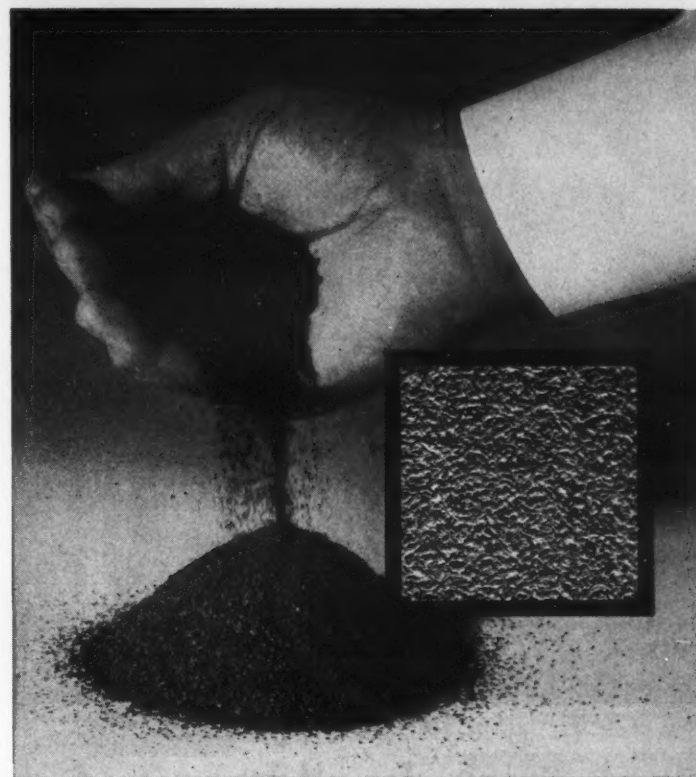
(Package was developed and is manufactured by Scholle Northlake Corp., Dept. CP, 220 W. North Ave., Northlake, Ill. . . . or for more information check CP 4914 on form opposite last page.)

(Polyethylene film for electrolyte package is product of Visking Corp., Dept. CP, 6733 W. 65th St., Chicago 38, Ill. . . . or for more information check CP 4915 on form opposite last page.)

The alphabetical Product Directory (starting on page 225) will give you a page reference to all articles and advertisements in this issue



Rough  
treatment  
proves



## Rheem integrated drum linings can take it

Lined steel drums must often take more than body blows in shipment. Riding under a blistering sun one day, they may be standing in snow the next. And if a lining lets go, your customer might get a drumful of unusable goods.

In the Rheem laboratories, our engineers fight back. They take drums loaded with hard-to-handle products on special trips. Trips through 160° temperature shifts that end in shattering, waist-high drop tests. Out of this planned abuse come better lining materials — better *applied*, to hold on and take it.

That's how Rheem learned long ago good linings start with the steel.

They blast their drums with high carbon steel shot, to scour and roughen the surface, and give the linings sawtoothed, naked grips. No sandwiched scale between lining and steel to invite flaking or peeling. Rheem linings can't slip or slide. They're *integrated*.

Extra step? We take lots of them. Like curing linings on our drum bodies and on their smaller tops and bottoms, in separate ovens for the individual treatment their different sizes require. Only *extra* steps lead to newer and better containers and product protection. We gladly take them. They've made us the world's largest manufacturer of steel shipping containers.

YOU CAN RELY ON



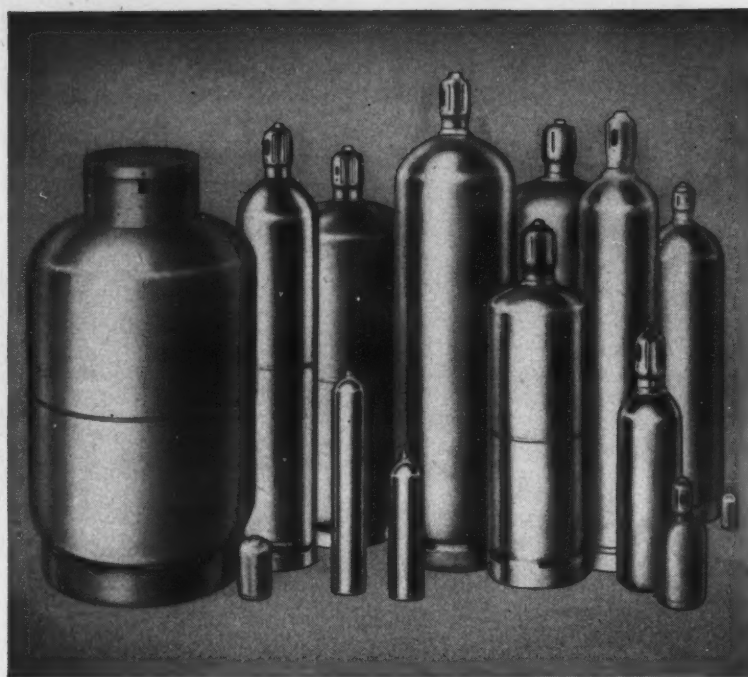
MANUFACTURING COMPANY

RICHMOND AND SOUTH GATE, CALIF., HOUSTON, CHICAGO, NEW YORK, NEW ORLEANS, LINDEN, N. J. AND SPARROWS POINT, MD.



E.	D.	C.	B.	A.
Have a hard-to-hold product? Chances are our lab has a lining just right for you. They have A to Z experience in solving lining problems. Write today.				
<b>RHEEM MANUFACTURING COMPANY</b> 7600 S. Kedzie, Chicago 29, Ill.				
NAME _____				
COMPANY _____				
POSITION _____				
STREET _____				
CITY _____ ZONE _____ STATE _____				
PRODUCT _____				

When inquiring check CP 4916 opposite last page



## In all sizes...for all compressed gases Hackney seamless or two-piece cylinders

Hackney compressed gas cylinders are designed with low tare weight for easy handling and freight-saving shipping—either empty or filled. Yet adequate strength is always assured by the use of selected, high-grade steel. The Hackney manufacturing process draws the side walls to uniform thickness that eliminates unnecessary weight.

Hackney cylinders are uniform in size and weight—uniformly easy to handle—uniformly durable for long service with the busy chemical shipper. Made in many sizes—for high-pressure or low-pressure shipment of all types of gases. Write today for full details.

### Hackney cylinders are regularly furnished for shipping compressed gases such as:

Argon	Chloropicrin
Anhydrous Ammonia	Helium
Chlorine	Hydrocyanic Acid Gas
Refrigerant Gases	Sulphur Dioxide
Butane and Propane	Sulphur Hexafluoride
Carbon Dioxide	Anhydrous Hydrogen Chloride
Oxygen	Boron Trifluoride
Methyl Bromide	—and many, many others
Nitrogen	

### Pressed Steel Tank Company

1463 S. 66th St., Milwaukee 14, Wis. • Manufacturer of Hackney Products

52 Vanderbilt Avenue, Room 2087, New York 17 • 235 Hanna Bldg., Cleveland 15 • 936 W. Peachtree St., N.W., Room 126, Atlanta 3  
208 S. LaSalle St., Room 796, Chicago 4 • 568 Roosevelt Bldg., Los Angeles 17 • 4950 Main St., Room 210, Kansas City 6, Mo.  
144 Wallace Ave., Downingtown, Pa.



## PACKAGING

**Sews 40 feet per minute,  
weighs only 10½ lb . . .**

portable unit closes burlap or paper bags;  
weighs only 10½ lb ready for use

**Uses:** Bag closing operations where volume precludes use of more extensive set-ups.

**Features:** Unit closes lightest to heaviest textile, fiber or paper bags, whether asphalt treated or otherwise specially processed.

**Description:** Closer powered by 1/12-hp electric motor, weighs 10½ lb with full thread cone. Unit



Closer weighs 10½ lb, is operated with one hand

sews 40 feet per minute; can be adapted for stationary operation with suspension unit and counterweight.

(Portable bag closer is product of Dave Fischbein Co., Dept. CP, 2720-30th Ave., S., Minneapolis 6, Minn. . . . or for more information reader may simply check CP 4918 on the convenient Reader Service slip which is located opposite last page.)



"I'm flying to the Packaging Show"



"Bon Voyage"



## POLYLINERS

### Put the finger on WASTE & SPOILAGE

Poly Liners make good things much better. Experience proves that C-Line Polyethylene Liners provide extra protection that stops waste and spoilage.

for CANS

for CARTONS

for DRUMS

C-Line Poly Liners are odorless, tasteless, non-contaminating . . . water-proof, non-absorbent and resist most acids and alkalis . . . strong and tear resistant.

C-LINE POLY LINERS ARE ECONOMICAL—THEY CAN BE RE-USED—YOUR ADDITIONAL PROFITS COME FROM SAVINGS IN PACKING, CAPACITY AND PRODUCT PROTECTION.

For complete information . . . contact the C-Line Personal Service Department.

PLASTICS DIVISION  
CANTON CONTAINERS, INC.  
Canton 7, Ohio . . . Phone GL 5-5346

When inquiring check CP 4919  
opposite last page

CHEMICAL PROCESSING

CONTAINERS AND PRESSURE VESSELS FOR GASES, LIQUIDS AND SOLIDS

When inquiring check CP 4917 opposite last page

Low-C  
save t



ROLACODER  
side marker  
curate spot  
ing of bran  
varieties,  
dates, lat  
on cases,  
fibre drums  
etc.

Friction-dri  
ically . . . se  
for easy d  
case-sealer  
8-hour ink

Got  
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When



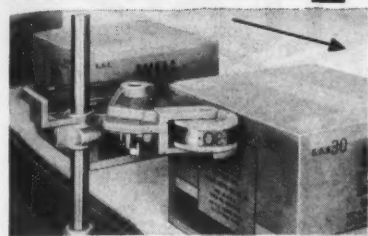
LERM  
Help

Packag  
some cor  
glass, av  
printed  
plastic c  
and sam  
ular sug

When i



## Low-cost marking attachments save thousands of \$ every year



ROLACODER twin-action markers... for imprinting codes and lot numbers on 2 or 4 sides of cases simultaneously... without requiring cases to be turned.

ROLACODER single-side marker for accurate spot imprinting of brand names, varieties, code dates, lot numbers on cases, cartons, fibre drums, bags, etc.



Friction-driven ROLACODER markers do your marking automatically... save cost of manual stencilling or stamping. Designed for easy do-it-yourself installation on existing conveyor lines, case-sealers, etc. They use quick-change rubber type or dies, hold 8-hour ink supply.

Write for descriptive literature

**Gottsch**

**ADOLPH GOTTSCHO, INC.**  
Dept. W, Hillside 5, N. J.

Automatic Production-Line CODING, MARKING, IMPRINTING MACHINES  
In Canada: RICHARDSON AGENCIES, LTD., Toronto & Montreal

When inquiring check CP 4920 opposite last page



## LERMER PLASTIC CONTAINERS Help You Make Satisfied Customers

Package your products in Lerner Plastic durable, handsome containers. They are shatterproof, 75% lighter than glass, available clear or opaque in many colors, can be printed or decorated and are available with metal or plastic closures. Write for complete catalog information and samples. If possible, send along products for particular suggestions.



**LERMER PLASTICS, INC.**

Pioneers and Pacesetters in Plastic Packaging  
530 South Ave., Garwood, New Jersey

When inquiring check CP 4921 opposite last page

APRIL 1956

## PACKAGING

### Stackable can aids display, storage, shipping...

outward curl on spout eliminates sharp inside edges

Designed for packaging wide range of liquids, solderless, oblong can is built with clinched nozzle, allowing lithographed top. No-drip spout with outward curl on neck eliminates sharp inside edges, aiding packaging of corrosive products. Can's completely enameled interior provides protection for hard-to-hold



Unit is available with nozzle in either center or corner of top

product. Compact stackability, provided by small recess in the center bottom of can, permits easier display, and better storage and shipping.

Cemented side seam permits lithography all around the can. Container is available with nozzle in center or corner of the top. Can is made in either quart or pint sizes.

(I-style container is manufactured by American Can Company, Dept. CP, New York Central Bldg., New York, N. Y. . . or for more information check CP 4921A on form which is located opposite last page.)

*you can*

Soda Ash

ACETAMIDE

Phenol

Alum

*pack*

*ship*

*store*

*almost any*

*dry chemical*

*in CHASE*

*bags*

*and save money doing it!*

Chase Multiwall bags give your dry chemicals (effluorescent, deliquescent or anhydrous) *complete* protection—yet, they cost far less than fiber drums, metal containers, or barrels...and they save up to 75% in storage space, too. Available in any combination of plies, with or without liners, tailored to YOUR exact requirements.

CHECK WITH CHASE—WHATEVER YOUR PACKAGING NEEDS

**CHASE  
BAG** COMPANY

General Offices: 309 W. Jackson Blvd., Chicago 6, Ill.

Prompt shipments and personal service from 32 nationwide branch plants and sales offices.

When inquiring check CP 4922 opposite last page

**Freight rates are up—**

# But here's how you can cut shipping costs

With rail freight rates up (and truck and barge rates slated to jump, too) the tare weight of your shipments is now more important than ever.

Shipping in Bemis Bags instead of heavier containers is probably your answer. Call your Bemis Man . . . let him show you how others have reduced their shipping costs \* . . . and how you may reduce yours.

And there are other advantages. Bags are the lowest priced containers. You save on storage space, especially for the empty containers. Filling, closing and handling frequently cost you less.

Get the *complete* story. You might cancel out that freight rate increase . . . or more.

## \* A couple of examples:

A shipper of dry milk reduced tare weight 18 to 20 pounds per hundredweight by switching from drums to Bemis Bags.

Western lettuce shippers reduced tare weight 975 pounds per car by using multiwall paper bags instead of cartons.

# Bemis



**GENERAL Offices—St. Louis 2, Mo.**  
**Sales Offices in Principal Cities**

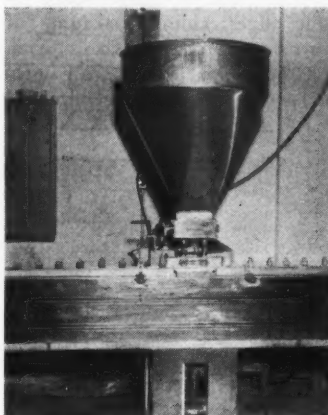
When inquiring check CP 4923 opposite last page

## PACKAGING

**Dispenses 4 to 16 oz —  
30 to 60 containers  
per minute**

**Uses:** For bottle filling operations where quick change-over from size to size is consideration.

**Features:** Filling machine handles bottles, jars, or plastic bottles and is designed for quick changes between these.



Fully automatic unit handles liquids and semi-solids

**Description:** Fully automatic piston filler dispenses at rate of 30 to 60 containers per minute. Handling liquids and semi-solids, unit has acid-resisting contact parts, deposits from 4 to 16 oz, and can be dismantled for cleaning in less than five minutes.

(Simplex Model T filler is made by F. L. Burt Co., Dept. CP, 571 Seventh St., San Francisco, Calif. . . . or for more information check CP 4924 opp. last page.)

## **Corrugated boxes — how to test them**

Containing a comprehensive check list, 24-page booklet explains package testing. Individual checks are described and illustrated in detail. Testing terminology is fully defined.

"How to Test Corrugated Boxes" is issued by Hinde and Dauch, Dept. CP, Sandusky, Ohio. Specify CP 4925 on form opposite last page.



**All styles of steel  
pails and drums  
Sizes 1-1½-2-2½-3-3½  
4-5-6-6½-10-12 gallons**



## **Available with all types Nozzles and Pouring Spouts**

Vulcan makes the finest open head steel pails and closed head drums in the above sizes . . . Every pail thoroughly tested . . . All meet rigid I.C.C. specifications.

## **HI-BAKE LININGS ASSURE PROTECTION**

Vulcan chemists will work with you to develop a Hi-Bake protective interior lining to meet your specifications and packaging problems . . . Your assurance of "positive product protection." Complete facilities available to design and lithograph your Brand Name on any size or style container.

**If we don't have what you want—we'll design it!**

**Call or write today for samples and more information.**

**OVER 40 YEARS CONTAINER EXPERIENCE**

# VULCAN

CONTAINERS INC.

Bellwood, Illinois (Chicago Suburb) Phone: Linden 4-5000  
In Toronto, Canada—Vulcan Containers Limited.  
Representatives in all Principal Cities

When inquiring check CP 4926 opposite last page  
**CHEMICAL PROCESSING**



## Simplicity is key to short-run line



Label paster supplies glue and delivers label to operator with slight turn of handle

printed label and delivers the label to the waiting hand of the operator. Printed side of label remains perfectly glue-clean while coated side provides over-



Hand labeling in Merck plant for short runs and specials. Lightweight machine is carried from one department to another as needed

all adhesion to cling firmly to containers. The extremely light labeling machine can be easily carried from one department to another as needed.

(Label paster is a product of Potdevin Machine Co., Dept. CP, 285 North St., Teterboro, N. J. Check CP 4927 opposite last page.)

### How to watch package lines with photocells

Four-page bulletin is printed in two colors and illustrated to show applications of photounits. Developments include monitoring for packaging, printing, and counting.

Bul 552 is issued by Ess Instrument Co., Div. of Ess Specialty Corp., Dept. CP, 96 S. Washington Ave., Bergenfield, N. J. When inquiring specify CP 4928 on form opposite last page.

# Continental FIBRE DRUMS



## quality controlled from forest to finished product

Only a company that has its *own* woodlands, paper mills, and production plants can turn out a fibre drum that's quality controlled every step of the way. That's why you get the best drum on the market from Continental. These drums can't be beat for rugged durability... give extra protection to regular products or dangerous chemicals. Their light tare weight means savings at today's high freight costs, too. What's more, Continental's fibre drums are neat and trim, tailored to your product, feature quality printing or spray painting.

So check Continental's fibre containers — Leverpak, Stapak or Fiberpak. You'll get bigger profits, lower packaging and operating costs, too. Call Continental soon, won't you?

**CONTINENTAL © CAN COMPANY**

FIBRE DRUM DIVISION • VAN WERT, OHIO

New York • Philadelphia • Pittsburgh • Tonawanda • Cleveland • Chicago • Atlanta • St. Louis • San Francisco • Los Angeles • Eau Claire • Boston



When inquiring check CP 4929 opposite last page

# OXYGEN

key to modern industrial processes

Control it with...

**Arnold O. Beckman**

## OXYGEN ANALYZERS!

Oxygen in some form or other is one of the most important factors found in modern chemical and industrial processes. Whether to minimize product oxidation (prepared atmospheres, air infiltration, etc.)...or to insure adequate oxygen for efficient combustion (boilers, kilns, etc.)...or to control oxygen for proper process operations (ammonia, acetylene, air fractionation, etc.) oxygen control has become too important in today's operations for

any profit-minded executive to ignore.

And because they are the *only* instruments that measure oxygen content directly, accurately and conveniently, Arnold O. Beckman Oxygen Analyzers have become the leading instruments for modern oxygen control in a wide range of applications—from catalytic refineries to cement kilns—from power plants to personnel protection.

These instruments (and systems) can be built to meet *your individual needs*.

### These instruments offer many unique advantages...

**SELECTIVITY:** Highly sensitive to oxygen. Effects of gases other than oxygen are negligible.

**HIGH ACCURACY:** 1% of full scale (Example:  $\pm 0.05\%$  O<sub>2</sub> on range 0-5% O<sub>2</sub>).

**MANY RANGES:** Full scale ranges from 0-1000 ppm or up to 0-100% O<sub>2</sub> available. Combustion ranges 0-5, 0-10, 0-15% O<sub>2</sub> supplied with 0-25% O<sub>2</sub> check range. Multi-range instruments available.

**RAPID RESPONSE:** Standard Analyzers—95% response in less than 1 minute. Special Units—95% response in 7 seconds!

**USE ANY RECORDER:** Millivolt output for potentiometers; current output for miniature electronic recorders and galvanometers; air output for pneumatic receivers and control systems.

**PACKAGE UNITS:** Analyzers and controls may be built into a cubicle with sampling components wired, piped, and ready for installation as a single unit.

**SAMPLING SYSTEMS:** Complete standard systems—components, package or portable units are available.

**OTHER ADVANTAGES:** Instruments may be mounted in explosion-proof cases, mounted indoors or outdoors, in portable panels, and have other desired features.



**Model F3:** Ranges of 0-1%, 0-5%, 0-10%, and higher. Meter on door for convenient readings at sampling point.

**Model G2:** Full scale ranges 0-0.1%, 0-0.5%, and others for low O<sub>2</sub> content. Ranges 90-100%, 95-100% O<sub>2</sub> for high O<sub>2</sub> content.

The above are but two of the complete range of Arnold O. Beckman Oxygen Analyzers available for every requirement.

**Arnold O. Beckman INC.**

## ANALYZERS

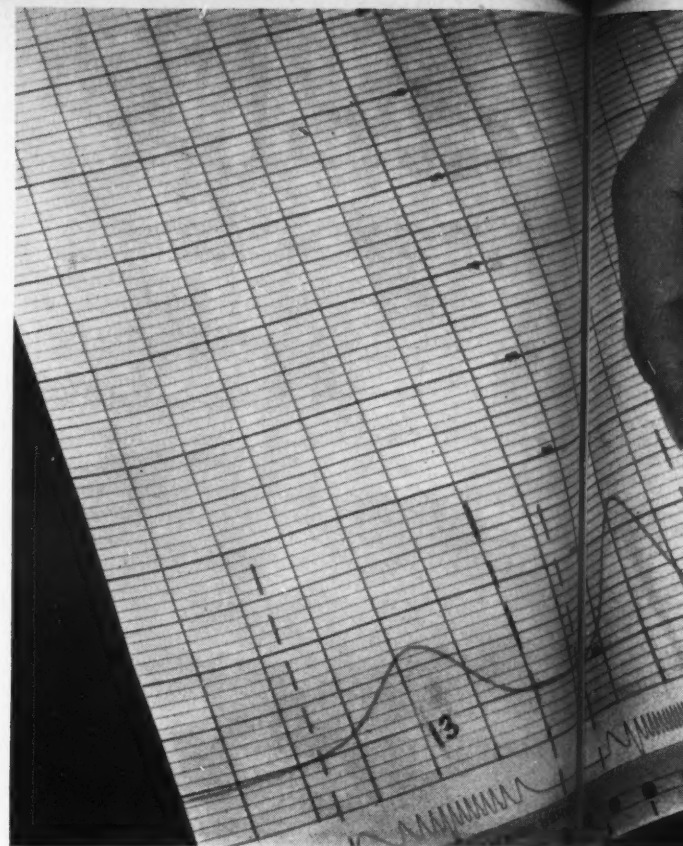
Profit Builders for Industry

1020 Mission Street

South Pasadena, California

for the laboratory

Peak just above pencil point shows one component emerging from analyzer — pips just below pencil point show integrated area under curve. Note that each tenth pip is enlarged for easier counting of areas of large peaks (see previous peak)



Automatic and accurate,  
vapor-phase chromatography unit has...

*separation resolving power  
equivalent to  
1000 theoretical plates*

And chart record of test shows sample make-up quantitatively as well as qualitatively

ALTHOUGH gas chromatography has long since moved from the research stage, development of this automatic quantitative analyzer is a definite advance. It was developed for analysis of petroleum and petrochemicals by Gulf Research & Development Company and the manufacturer's Research & Development Laboratories. In addition to this field its use is likely in identifying hard-to-separate or analyze trace

impurities in solvents. It will probably also be used in analysis of fuels, flue and other plant gases, mine gases, in air pollution and smog studies, for quality control of foods, spices, tobacco, perfumes, and other materials where volatiles or essential oils are involved.

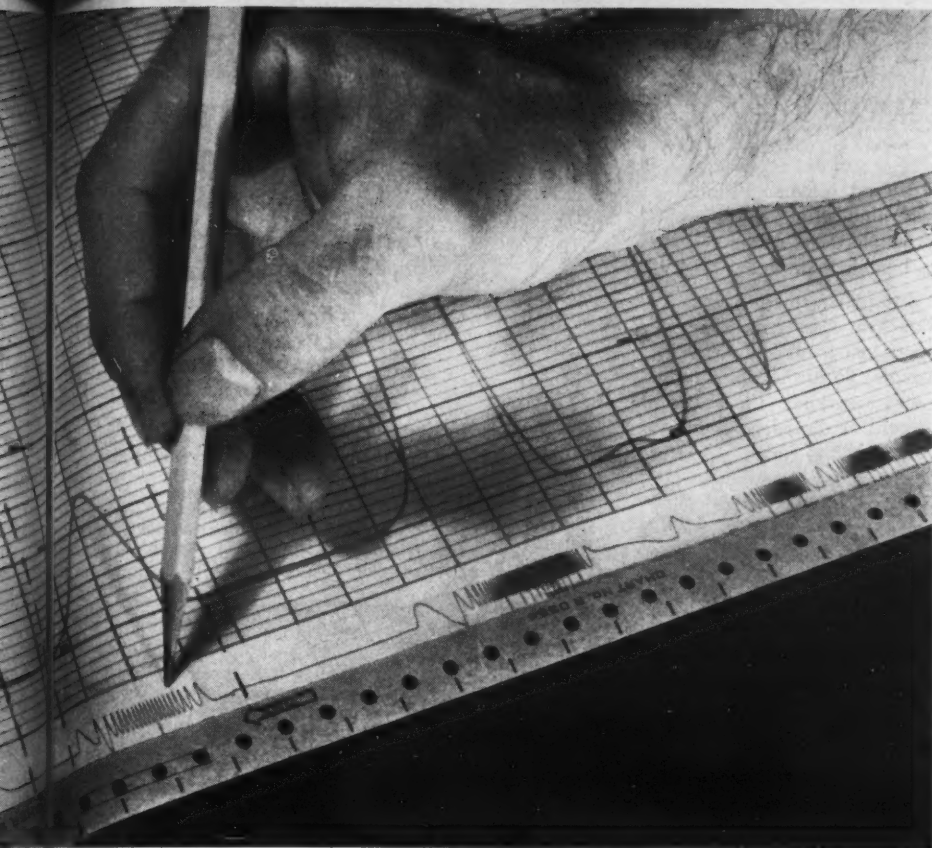
Partition chromatography has already been applied in research work to separation of amines, fatty acids, *cis*, and *trans* isomers,

Send for helpful free literature which describes Arnold O. Beckman instruments in detail. When writing, outline your particular application—we'll gladly supply specific information.

Ask for Data File 20H-46

When inquiring check CP 4930 opposite last page





*ortho*, *meta*, and *para* isomers, saturated and unsaturated hydrocarbons, cycloalkanes, chlorinated hydrocarbons, aniline, and related compounds and derivatives.

Despite the complexity of some of these separations by conventional methods, this device can be operated successfully by a

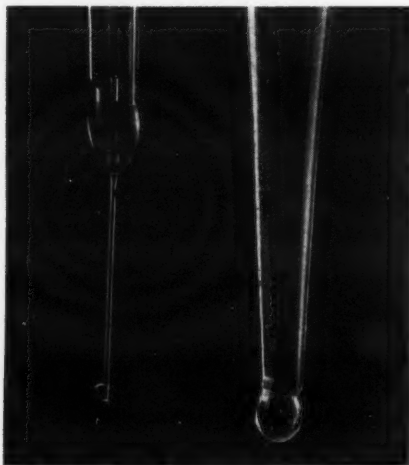
laboratory technician.

To achieve a "resolving power" equivalent to a distillation column with more than 1000 theoretical plates, this analyzer makes use of gas-liquid partition chromatography. In operation, an inert gas (typically helium)

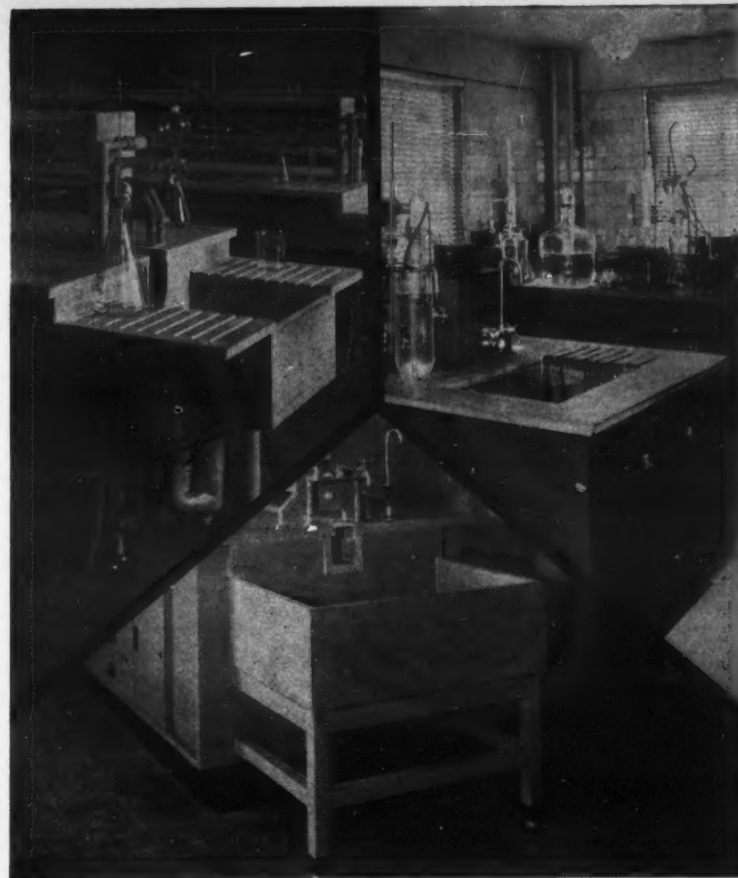
(Please turn to next page)



Sample is injected by means of syringe — results are recorded minutes later on strip chart



Sample size (left drop) compared with a normal drop at burette tip



## Let's talk "SPECIAL SIZES"

The size and depth of sinks for laboratory and industrial use should be determined by the job they have to do — *and not by available standard sizes!*

With Alberene Stone sinks you can specify any size and depth — without paying a premium.

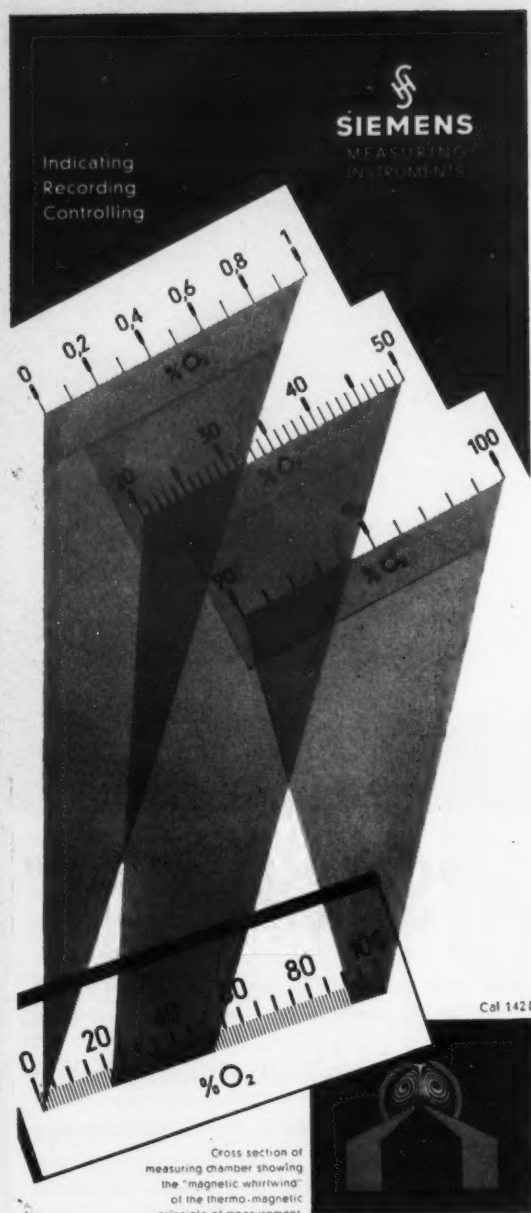
And with Alberene Stone you get — *the natural silicate stone with the surface that goes all the way thru*. Its all-silicate mineral components resist chemical attack. Low absorbency makes it essentially nonstaining. Discolorations can be removed by scouring or honing without harm to the surface.

For information and technical assistance, address: Alberene Stone Corporation, 419 Fourth Avenue, New York 16, N. Y.

# ALBERENE STONE

**provides LOW ABSORBENCY protection**

When inquiring check CP 4931 opposite last page



Extremely low, elevated, and medium oxygen contents of gas mixtures can be continuously measured with our

Oxygen Meter **OXYMAT**<sup>\*</sup>  
based on the magnetic properties of oxygen.

At the German Industries Fair in Hannover, Hall 9, we are exhibiting Measuring and Testing Instruments, Control Systems for Industrial Processing, and Equipment for Non-destructive Material Testing.

SIEMENS & HALSKE AKTIENGESellschaft  
WERNERWERK FÜR MESSTECHNIK · KARLSRUHE

When inquiring check CP 4932 opposite last page

## FOR THE LABORATORY

### Separation Resolving Power

(Continued from preceding page)

"sweeps" sample through packed column. Packing in this column is coated with high-boiling absorbing liquid. Components of the sample travel at different rates in the column, thus become separated.

As they emerge they are detected by thermal conductivity cell and recorded on strip chart. Area under each peak on chart is proportional to mole fraction of that component in the sample. To further simplify analysis, this device integrates area under the peak automatically. A separate record at the edge of the chart consists of a series of "pips" to indicate this area. For large areas where pips have become crowded, interpretation is eased by the fact that each tenth pip is enlarged.

Samples needed for this analysis are small — only 0.01-0.03 ml of liquid or 0.3-0.6 ml of gas are required. A sample of this size provides full analysis for many components in a few minutes.

By using a stable AC power supply, from 115v 60 cps line for conductivity cell, analyzer does not require batteries. It does have a continuous sensitivity control with which operator can magnify low peaks, or keep high peaks on chart. Built-in strip chart recorder is 0-5 mv full scale and has standard 11-inch width chart. Chart speeds of 1/4 and 1/2-inch per minute are standard.

Needle valve and calibrated flowmeter are used to control flow rate of carrier gas. Thermostated air bath maintains operating temperature of the 14-foot packed column. This bath also holds steady temperature at thermal conductivity cell and preheater coils for carrier gas. Operator can select working temperature (50°, 65°, 85°, or 100°C) by turning a switch. Two hundred fifty-watt continuous heater plus 25-watt cycling heater hold temperature steady. This temperature control is important in maintaining a straight, smooth baseline so that even small deflections can be measured.

Usual packing for tower itself is diatomaceous earth which has been fired at high temperature. Packing is selected for a narrow range of particle size, is free-flowing and produces low back pressure in the column. Interchangeable preppacked columns with other types of packing are also available. Usual coating material for tower packing is tri-meta-cresyl phosphate, found to be very efficient for petroleum compounds. Other liquid coatings are also available on special order. Field tests have shown that packing removal and reconditioning between runs is usually unnecessary. One packed column has been in industrial use for more than a year, shows no deterioration.

(Fisher-Gulf Partitioner is a product of Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. . . . or for more information about manufacturer's product reader may simply check CP 4933 on the convenient Reader Service slip which is located opposite last page.)



# LIGHT BUT SO STRONG!

## TOTELINE FIBERGLASS TRAYS

For Drying:  
**CHEMICALS  
PHARMACEUTICALS  
ANTIBIOTICS**

They're feather-light, but they're durable and sturdy as any trays you've ever used! What's more, the large inside corner radii makes them very easy to clean. And, because fiberglass does not absorb heat, the materials dry faster in Toteline trays. Many sizes available. Write

TOTELINE  
Wherever  
materials  
are handled



### MOLDED FIBERGLASS TRAY CO.

World's largest producer of fiberglass reinforced resin trays. Toteline

LINESVILLE, PENNSYLVANIA

When inquiring check CP 4934 opposite last page

## made to measure

Every item in the Diamond D Blue Line will measure with maximum accuracy and uniformity. The graduations are calibrated with extreme care and the etching is deep and clear to afford maximum readability.

The pigment in the Diamond D Blue Line is heat-fused into the graduations and is impervious to practically every chemical.

The Diamond D Blue Line is annealed in electrically-controlled lehrs to relieve internal strain and each piece is double tested to rigid standards. When you need laboratory glassware with built-in accuracy and uniformity, specify the Diamond D Blue Line.

Send for FREE brochure today.



## DOERR GLASS COMPANY

VINELAND, N. J.

When inquiring check CP 4935 opposite last page

CHEMICAL PROCESSING



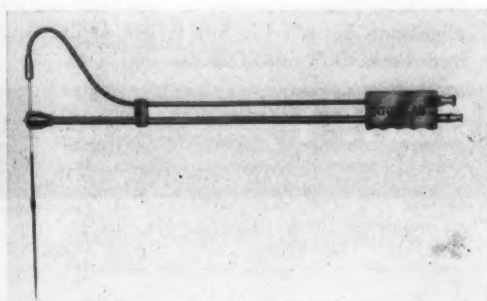
**Add a two-foot extension  
to your hands and lips  
for "hot" liquids . . .**

allows performance of all pipetting operations without necessity of handling pipet

**Uses:** For pipetting radioactive solutions without necessity of handling pipet.

**Features:** Pipet control device will accommodate almost all sizes and styles of pipets and has replaceable parts where contamination may occur.

**Description:** Pipet controller grasps and releases narrow glass pipet tube by manipulation of finger-grooved grip. "Hot" and "semi-hot" liquids device handle and operated manually. Device adds are sucked up into pipet by syringe located in approximately two-foot extension to operator's



Finger-grooved grip with syringe control in handle controls pipet

hands and lips. Pipetter can also be used for remote manipulation of other dangerous liquids as germ cultures, acids, or volatile and toxic substances where contact or inhalation may be harmful.

(Model RP-1 Radi-Pipetter is product of The Atomic Center, Dept. CP, 489 Fifth Ave., New York 17, N. Y. Check CP 4936 opposite last page.)

**Features portable glossmeter  
for appearance tests**

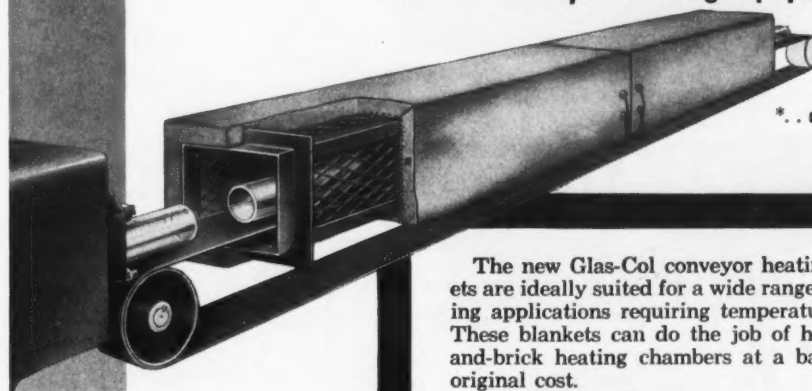
In addition to describing a portable glossmeter for appearance tests, 92-page catalog also describes instruments for testing paint, paper, rubber, plastics, ceramics, oil, leather, food. Range of instruments covers physical measurements as appearance, viscosity, film thickness, drying time, abrasion, adhesion, color. Instruments are listed by application. Short description of method is included with description of each instrument.

1956 Catalog is issued by Gardner Laboratory, Inc., Dept. CP, Bethesda 14, Md. When inquiring specify CP 4937 on form opposite last page.

*. . for curing, annealing,  
tempering, roasting*

## NEW GLAS-COL

**heating-chamber blanket slashes original  
cost\* of conveyor heating equipment**



\* . . and operating cost, too!

The new Glas-Col conveyor heating-chamber blankets are ideally suited for a wide range of industrial heating applications requiring temperatures up to 600° C. These blankets can do the job of heavy, bulky, steel-and-brick heating chambers at a bare fraction of the original cost.

And, heating costs are much less, too! Specific applications of Glas-Col conveyor heating-chamber blankets include (1) curing rubber products, such as silicone rubber elastic threads, tubing and other shapes; (2) annealing and tempering various metal parts . . . and also glass parts, such as bottles, TV picture tubes; (3) plastic products, such as extruded tubes, molding and gaskets; (4) drying and roasting granular materials, such as catalysts; and (5) roasting and drying a wide variety of foods.

**Construction and Design:** Glas-Col heating blankets can be engineered for belts of any width or length. For flexibility of manufacture, shipping, installation and maintenance, the blankets are built in multiple units . . . each ranging from four to eight feet in length.

Heating elements, constructed of high-quality resistance wire imbedded in layers of glass fabric, are positioned so that the same temperature is maintained from left to right and front to back of the heating chamber.

For additional information, contact Glas-Col Apparatus Company, Dept. CP, 711 Hulman Street, Terre Haute, Ind.

## GLAS-COL

Trademark Registered U. S. Patent Office

**ELECTRIC HEATING MANTLES**

U. S. Patent  
No. 2,282,078



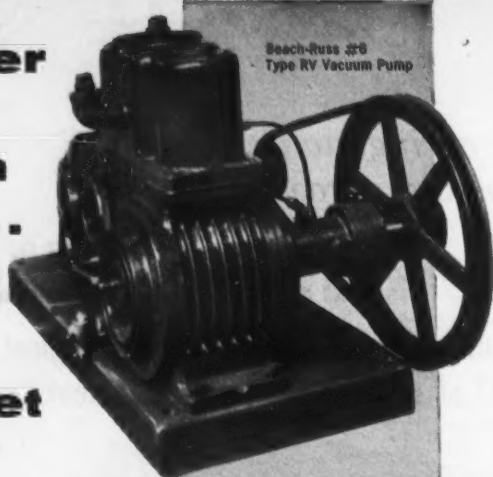
U. S. Patent  
No. 2,231,506

**Specialists in Laboratory and Pilot Plant  
Heating Problems**

When inquiring check CP 4938 opposite last page

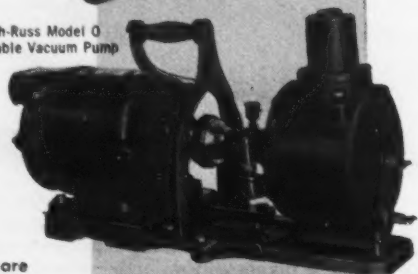
**Whatever  
Your  
Vacuum  
Needs...**

**BEACH-  
RUSS  
Can Meet  
Them**



Beach-Russ 275  
Type RV Vacuum Pump

Beach-Russ Model O  
Portable Vacuum Pump



Beach-Russ High Vacuum Pumps are available in a complete range of types and sizes to meet any vacuum need. From the smallest 1 c.f.m. portable unit for testing and dehydrating work, to the large 1800 c.f.m. units for process operations, these precision-built

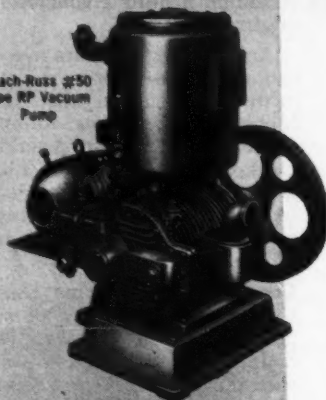
**BEACH-RUSS  
Vacuum Pumps**

give

**Fast "Pump-Down"  
High Efficiencies  
Quiet, Vibrationless Operation  
Long Service Life**

If you are planning a new installation or are in need of technical advice, get in touch with Beach-Russ.

Beach-Russ 350  
Type RP Vacuum  
Pump



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• 50 Church Street • New York 7, N. Y.

**Dept. 46**

☐ We are interested in Beach-Russ Vacuum Pumps for

☐ Send \_\_\_\_\_ copies of General Bulletin No. 89.

NAME \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ ZONE No. \_\_\_\_\_ STATE \_\_\_\_\_

When inquiring check CP 4939 opposite last page

## LABORATORY

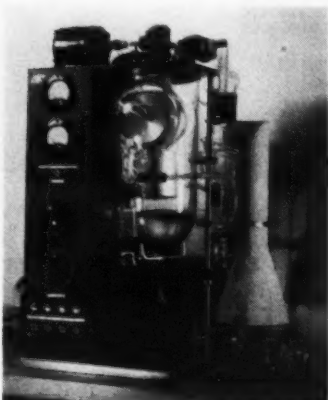
**Uses centrifugal action  
under high vacuum  
to distill...**

separates "heat sensitives"  
with less thermal hazard

**Uses:** For laboratory distillation of heat sensitive synthetic and natural oils, resins, other materials that have molecular weights above 200.

**Features:** Centrifugal molecular still operates with a maximum thickness of 0.1 mm on evaporating surface. Liquid is in contact with heat source from 0.05 to 0.2 sec.

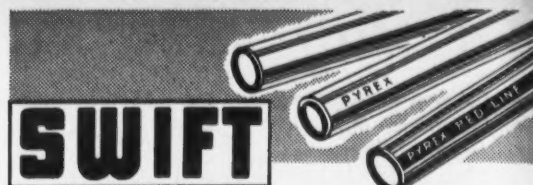
**Description:** Diffusion pump establishes vacuum inside bell jar to less than ten microns Hg. Rotor is then started and turns at 1725 rpm. Liquid to be distilled is fed onto rotor and spread to thin film by centrifugal force. Thickness of film ranges from 0.01 to 0.1 mm. Materials are evaporated almost instantly.



Material is fed onto heated rotating cone for distillation

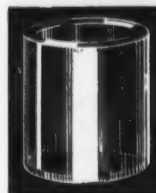
Concave rotor is 5" disc with electric heaters embedded in cast aluminum. Temperature range is from 70° to 300°C. Gear device on feed pump controls rate of flow onto rotor with four feed rates. Temperature of rotor is measured with thermocouple.

Still is enclosed in glass bell jar on three-legged spring clamp. Concave surface on side of jar serves as condensing surface. Two-port stopcock channels fractions



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**GAUGE GLASS  
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Then write, wire or phone Swift for immediate delivery.**

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**SWIFT Glass Division**

SWIFT LUBRICATOR COMPANY, INC., ELMIRA, N.Y.  
807 Mateo St., Los Angeles • 140 Baylston St., Boston 16

When inquiring check CP 4940 opposite last page

**accurately controlled CHEMICAL DEHYDRATION**

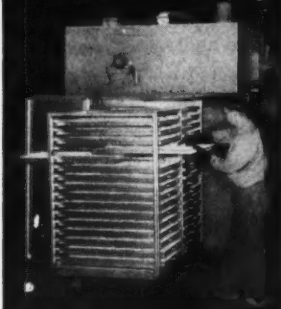
*with Despatch V-39 and V-41 INDUSTRIAL OVENS*

Here are two new ovens, proven in the field, that were developed especially for chemical dehydration and other processes that require larger air volume than normally found in standard ovens. Built-in exhaust fans can be regulated to control flow of air and will operate automatically at pre-set times.

**THE DESPATCH V-39**, a truck-loading, batch type oven, has proven itself in the chemical drying field. At Diamond Alkali Company's Painesville, Ohio plant they're reducing the moisture content of chromium chemicals from 15% to no more than 4% and holding it there. A 2-hour bake at 500°F does the job thoroughly!

Investigate the Despatch V-39 or V-41—you'll discover that they offer the large volume horizontal airflow that maintains exceptional temperature uniformity. They're double walled, with insulated construction that means top economy and have Micromatic control systems to hold temperatures within close limits.

Floor length doors make possible to roll loads directly



Trayloaded truck of chromium chemicals is readied for drying at Diamond Alkali Co. Trucks guide heavily loaded trucks into the V-39 oven—protect oven's interior.

into the V-39's 60 cu. ft. chamber or the big V-41's 101 cu. ft. oven. Both have 500°F ratings with gas, electric or steam heaters (heavy duty models rated at 650°F). Automatic safety switches and circuits protect the operator and the product at all times.

For complete technical details write for Bulletin 100—it describes the complete line of laboratory and production ovens made by Despatch.

**DESPATCH**  
Established 1878

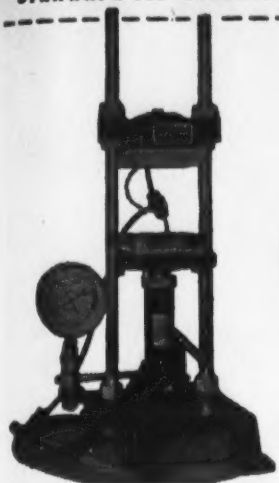
**DESPATCH OVEN COMPANY**  
343 Despatch Bldg., Minneapolis 14, Minn.

When inquiring check CP 4941 opposite last page

CHEMICAL PROCESSING



Standard for Research and Development



## the CARVER LABORATORY PRESS



... wherever Pressing is required.

Accurately controlled pressures to 20,000 lbs.; 6-inch gauge mounted on base. Carver Standard Accessories include Electric or Steam Hot Plates, Carver Test Cylinders, Swivel Bearing Plates, Cage Equipment. Available from stock. Write for catalog.

**FRED S. CARVER INC.**  
**HYDRAULIC EQUIPMENT**

52 RIVER ROAD, SUMMIT, N. J.

When inquiring check CP 4942 opposite last page



## MOISTURE CONTENT

without involved  
computations!

Quickly and accurately determine the moisture content in any material—whether fibrous, granular, liquid or semi-liquid—with the DIETERT MOISTURE TELLER. No involved computations. No skilled help required!

The No. 276 Moisture Teller is a sturdy, versatile unit, equipped with a thermostat having a range of 150 to 300°F. Ideal for drying an exceedingly wide range of samples. Drying temperature is controlled within 7 degrees of the selected temperature. The Moisture Teller may also be used as a drying oven. A complete line of Dietert Moisture Tellers is available for testing all types of materials, including large bulky samples of wool, fibres, paper and textile products.

**HARRY W. DIETERT CO.** *Control*  
**EQUIPMENT**  
9330 Roselawn, Detroit 4, Michigan

When inquiring check CP 4943 opposite last page

## LABORATORY

into feed. Receivers can be changed without destroying vacuum.

Materials with molecular weights up to 1200 can be handled. Unit was designed for samples of from 100 cc to 1½ liters but it will accommodate up to 2½ liters if residue compartment is disregarded.

(CMS-5 Molecular Still is product of Consolidated Electrodynamics Corp., Dept. CP, 300 North Sierra Madre Villa, Pasadena 15, Calif. . . . or for more information check CP 4944 on form opposite last page.)

### Tells how to pump distilled water

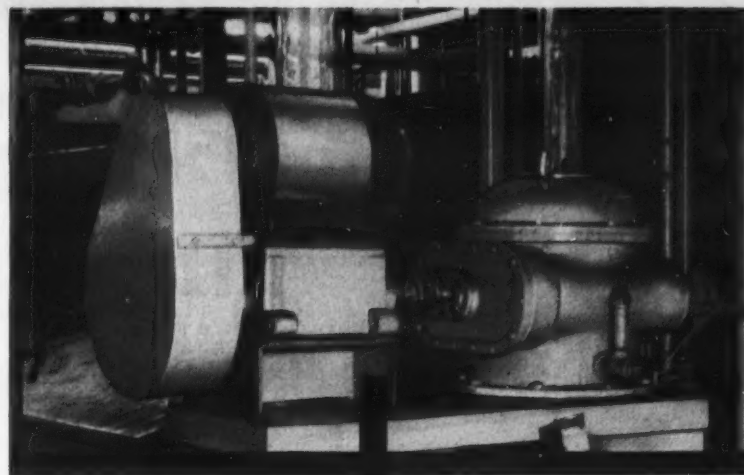
Illustrated bulletin describes bottle pump for distilled water. Salient feature is explained as an air filter to prevent contamination of water as air is forced in to drive water from storage bottle. Air filter is capable of removing particulate water as small as 0.2 micron. This includes bacteria causing tuberculosis, diphtheria, typhoid, tetanus — vapors and alkali or acid fumes are chemically absorbed, also.

Bul 136 is issued by Barnstead Still & Sterilizer Co., Dept. CP, 239 Lanesville Terrace, Forest Hills, Boston 31, Mass. When inquiring specify CP 4945 on form opposite last page.

### Explains test bath for viscosity

Two-page data sheet outlines features of manufacturer's redesigned viscosity bath. Information includes construction, dimensions, list of standard equipment. Bath features temperature uniformity of  $\pm 0.01^\circ\text{F}$  from  $70^\circ$  to  $212^\circ\text{F}$ .

Bul 743 is issued by Precision Scientific Company, Dept. CP, 3737 W. Cortland St., Chicago 47, Ill. When inquiring specify CP 4946 on form opposite last page.

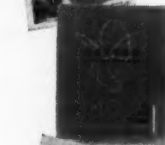


Take this Nettco Model T-27 Drive, for example. It is an engineered combination of Nettco experience and Nettco equipment — and because it's RIGHT for the job, this agitator speeds processing, reduces operating and power costs, and minimizes maintenance.

Nettco Model T Drives explain, in part, why Nettco can supply the right agitator for every job. There are five basic Model T Drives, supplied in any one of 35 easily changed ratios. This flexibility of equipment, coupled with Nettco's agitation research and experience in over 50 years of serving the process industries, is your continuing guarantee of the best in agitation from Nettco.



Bulletin No. 551, describes Nettco tank top, side entering, and pipe line mixers and Nettco agitator accessories.



Bulletin No. 532, a detailed review of the Nettco line of side-entering mixers for storage tank mixing.



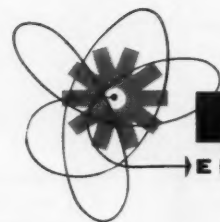
Bulletin No. 531, describes the Nettco Flomix®—a patented and unique pipe line mixer for continuous processing applications.

**FOR EVERY JOB  
THERE'S ONLY  
ONE AGITATOR  
THAT'S**

# RIGHT!

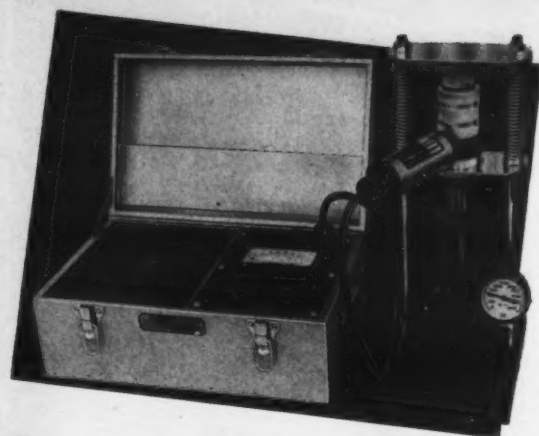


May we help you get the right agitator for your job? Send for catalogs or engineered recommendations, to New England Tank & Tower Company 93 Tileston Street, Everett 49, Mass.



**NETTCO**  
ENGINEERED AGITATION

When inquiring check CP 4947 opposite last page



## Is improper moisture in your products...

adding to operating expense? ☐ yes ☐ no

slowing production for tests? ☐ yes ☐ no

bringing customer complaints? ☐ yes ☐ no

**Any yesses?** Then it will pay you to find out how the Granular Moisture Register model G5, operating on high frequency power loss principle, will indicate moisture content quickly and dependably, help solve those problems with... **1-minute tests on the spot!** • **Practical Accuracy Guaranteed!** • **No skilled technicians!** • **Two weeks free trial!** • **Most granular products** such as:

Ammonium Nitrate • Ammonium Sulphate • Toilet Soaps • Plastic Molding Compound • Polyvinyl Chloride • Ammonium Perchlorate • Sodium Bicarbonate • Polyethylene Resins

**DOZENS MORE**

### ELECTRONIC MOISTURE REGISTER

Dept. CPB Instruments

Moisture Register Co., P. O. Box 910, Alhambra, Calif.

☐ We are interested in 2 weeks free trial offer. Send additional information regarding Model G5.

We will want to test

in a moisture range from \_\_\_\_\_ % to \_\_\_\_\_ %.

Firm Name \_\_\_\_\_

By \_\_\_\_\_ Title \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

When inquiring check CP 4948 opposite last page

## FOR THE LABORATORY

### Uses high-frequency RF for fast drying

Oven is self-compensating for sample load

**Uses:** For experimental laboratory use in rapid drying of sample quantities of solid and liquid materials.

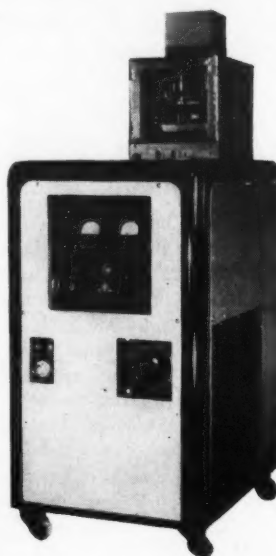
**Features:** Dielectric oven is automatic. It has an electronic load matching system to compensate for variations in physical properties of sample during heating cycle.

#### Description:

Dielectric oven is a radio frequency generator of 2 kw (rated) high-frequency power output. Power level can be adjusted from zero to full rated power according to need. Constant power input into sample is provided by load matching system. Inside dimensions of oven are 8 x 8 x 8".

Overall dimensions of the unit are 25 x 34 x 63". Models are available with rated outputs up to 20 kw.

(Erdco Dielectric Oven is product of Erdco Engineering Corp., Dept. CP, Official and Westgate Rds., Addison, Ill. . . . or for more information check CP 4949 opposite last page.)



Power level can be adjusted from zero to 2 kw

### Helps to remove guesswork from spectroanalysis . . .

each reagent bottle has facsimile of actual test curve made on spectrophotometer

**Uses:** Saves time for spectroscopist and analyst by eliminating necessity to check for certain impurities.

**Features:** Data curves of actual absorbance are furnished.

**Description:** Facsimile of actual curve from 220 to 360m $\mu$  range, covering actual lot analyses by spectrophotometer, is on each bottle of reagent. Spectrophotometer used is Warren Spectracord.

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will  
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We've shipped "Metalsmiths" corrosion-resistant utensils all over the world for more than 30 years, with utmost satisfaction. Highest quality materials and workmanship assure long wear. All items shown, plus beakers, stock pots, batch cans and shovels in stock. Buy, try, compare.

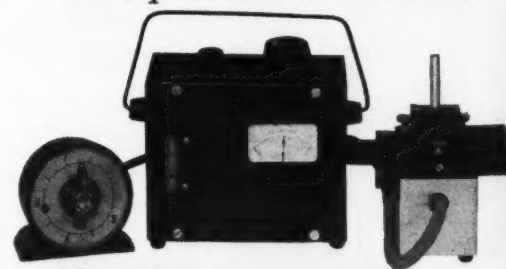


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**METALSMITHS**  
Division of Orange Roller Bearing Co., Inc.  
556 White Street Orange, N. J.

When inquiring check CP 4950 opposite last page

### For continuous, and accurate DUST SAMPLING with permanent records



#### KONISAMPLER (pat. pend.)

Employs principle of thermal precipitation. Light weight — quiet — all electric Automatic timer — will also operate continuously — secures particulate matter suitable for microscopic, electron microscopic or visual and for permanent records on standard glass slides.

Cost (complete)  
with carrying case \$225.00

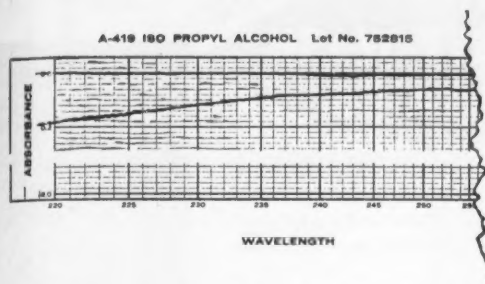
Send for descriptive literature K-1  
Designer and manufacturer  
of continuous gravimetric and  
oscillating types of  
thermal precipitators

**JOSEPH B. FICKLEN III**  
1848 East Mountain St.  
Pasadena 7, California

When inquiring check CP 4951 opposite last page

CHEMICAL PROCESSING





Absorbance curve for Lot No. 752815 of iso-propyl alcohol

High-purity reagents include acetone, carbon tetrachloride, chloroform, cyclohexane, methyl alcohol, methylene chloride, and iso-propyl alcohol. Typical analysis shows that batches of methyl alcohol have an absorbance 0.30 at wavelength of 220.

(Spectranalyzed Reagents are product of Fisher Scientific Company, Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. . . or for more information check CP 4952 on form opposite last page.)



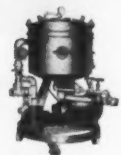
#### Constant temperature

. . . for 1000 bottles is maintained by this king-sized temperature bath. Built inside and out of stainless, bath has a 5 x 5 x 3 ft interior, built-in circulator, and insulated cover. It holds temperatures to 60°C within  $\pm 0.1^\circ\text{C}$ .

(Bath was custom-built by Labline, Inc., Dept. CP, 3072 W. Grand Ave., Chicago 22, Ill. . . check CP 4953)



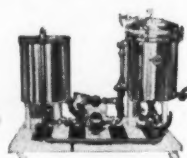
Laboratory filter.



Varnish and lacquer filter.



Plating solution filter (portable).



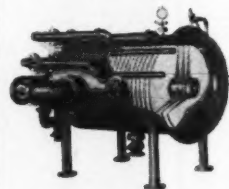
All stainless steel filter with stainless steel piping, valves, and slurry tank.



Standard horizontal plate filter.



Beer polishing filter.



Large volume water filter. Model SCJ. Single unit capacity up to 5,000,000 gal. per day.

# Sparkler Filtration Engineering

**...the key point of quality for many products**

At Sparkler, engineering special adaptations of standard filters to meet particular requirements of a product is a continuous daily occurrence. Engineers working on plant layouts and production line processes can get willing cooperation and the benefit of experience in solving similar problems from Sparkler.

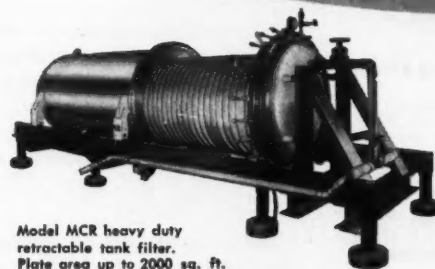
By concentrating on filtration engineering and manufacturing exclusively over the past 30 years Sparkler has been successful in improving filtration processes through sound engineering and with the development of hundreds of special filters particularly adapted to the requirements of food products, chemicals, pharmaceuticals, petroleum and derivatives, beer, whisky, sugar refining, electroplating and many other products as well as large volume water filtration for municipal and industrial use.

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## SPARKLER FILTERS



Model MCR heavy duty retractable tank filter. Plate area up to 2000 sq. ft.

Built to ASME specifications when required.

When inquiring check CP 4954 opposite last page

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Goodall Clothing and Footwear meet every plant and laboratory need with items of long-established quality and value. Practical design, selected materials and careful manufacture assure the utmost in protection, comfort and durability.



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### All-Purpose Gloves

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When inquiring check CP 4955 opposite last page

## LABORATORY

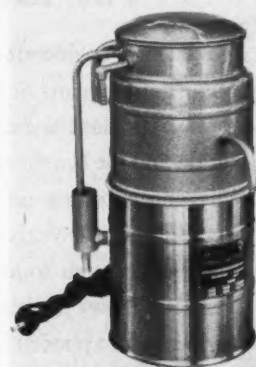
*Smaller than bottle,  
distills half-gallon  
of water an hour*

Uses: Supplies pyrogen-free distilled water for small volume users.

Features: Smaller than a 5-gallon distilled water bottle, still produces 1/2-gallon per hour.

Description: Redesigned still is a portable electric unit for small volume users of distilled water. It weighs only 10 pounds.

Construction materials are stainless and copper with critical sur-



Produces distilled water for 7.5 cents per gallon

faces coated with block tin. This safeguards water purity. Operation and design are simple—surfaces where lime could build up are designed to have wide areas so that clogging is eliminated. No mechanical components such as floats or valves are used. Rubber tubing is used to connect still to water supply—entire unit can be taken apart for cleaning quite easily.

Water level is maintained regardless of pressure, sedimentation, etc., by adjustable constant-flow head device. Arrangement of water and lead permits dual action of cooling of condenser and pre-heating in that water to make for high efficiency.

Manufacturer's tests indicate that distilled water can be produced for 7.5 cents per gallon (based

## BRIDGE THE "DANGER PERIOD" WITH HAW'S EYE-WASH FOUNTAINS



Even though summoned medical aid arrives as rapidly as possible, time elapsing between occurrence of eye accidents and a physician's care is too often the period when permanent harm is done.

Bridge this "danger period" with HAW'S Emergency Eye-Wash Fountains that permit injured workers instantaneously to wash injurious matter from their eyes with clear water at safe controlled pressure.



Available with HAW'S Drench Shower Attachment to form an "emergency first aid station" for your employees' protection. All HAW'S Safety Equipment is designed and manufactured in cooperation with leading safety engineers.



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**HAW'S DRINKING FAUCET CO.**  
1439 FOURTH STREET (Since 1909) BERKELEY 10, CALIF.

When inquiring check CP 4956 opposite last page



## WIRE-MESH PRODUCTS

for all filtering and straining applications.  
All meshes, all weaves, all alloys.



Send Specifications for an estimate. Department 27

**THE C. O. JELLIFF**  
MANUFACTURING CORP. SOUTHPORT, CONN.

When inquiring check CP 4957 opposite last page

CHEMICAL PROCESSING

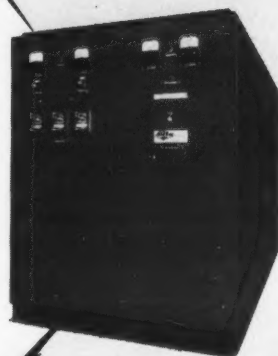


# 1<sup>ST</sup>

**In Reliability  
Efficiency  
Ease of Maintenance**

Millions of hours of dependable service from thousands of SEL-REX RECTIFIERS throughout the world, have established SEL-REX as the standard of the industry. NOW — SEL-REX GERMANIUM RECTIFIERS offer efficiency up to 96%. You get this initial extra-high efficiency for the life of the unit, because GERMANIUM has shown no chemical deterioration in over six years of testing and experimentation. As with all SEL-REX RECTIFIERS, SEL-REX GERMANIUM RECTIFIERS are "custom engineered" to your specific requirements... available in either air or water cooled models, with all types of fully automatic and remote controls. Nothing to wear or get out of order — only the cooling fan is in motion — SEL-REX "custom engineering" has reduced maintenance to the absolute minimum.

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**BART-MESSING CORPORATION**

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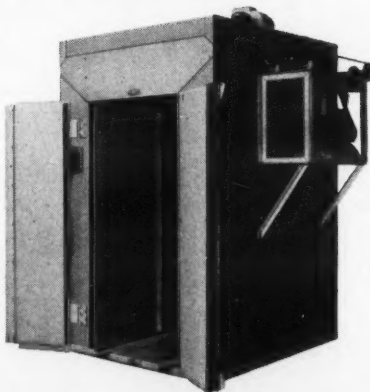
Sel-Rex units from 25 up to 50,000 amperes

When inquiring check CP 4958 opposite last page

**for Drying, Baking, Curing  
Process Materials under  
Controlled Conditions**

**ROCKWELL  
OVENS**

- Batch types — tray, rack or truck loading; standard and special.
- Conveyor types—belt, carrier, etc.
- Heating—electric, gas, steam or oil, with positive air recirculation.
- Accurately controlled processing temperature.
- Rugged, insulated steel or stainless steel panel construction.



Write for Catalog



**W. S. ROCKWELL COMPANY**

FURNACES • OVENS • BURNERS • VALVES • SPECIAL MACHINERY

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Sales Representatives in Principal Cities

When inquiring check CP 4959 opposite last page

## LABORATORY

on 3 cent per kilowatt hour power). Unit also has a moderate first cost.

(Midget Water Still is a product of Precision Scientific Co., Dept. CP, 3737 W. Cortland St., Chicago 47, Ill. Check CP 4960 opposite last page.)

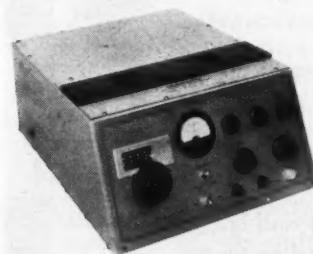
**Measures differences  
in reflectance  
of colors...**

digital reflectance indicator is calibrated to 0.0002 units

**Uses:** Measuring color transmission reflectance of synthetic fibers, paints, liquid solutions, pigments, slurries.

**Features:** Differential colorimeter has sensitivity to color differences within 0.0001 reflectance units.

**Description:** Instrument is an improved version of manufacturer's colorimeter. It has substantial improvement in sensitivity when dark samples are being measured. Instrument has a simplified switching arrangement and a digital reflectance indicator



Colorimeter has improved sensitivity for measuring dark samples

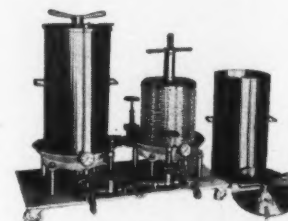
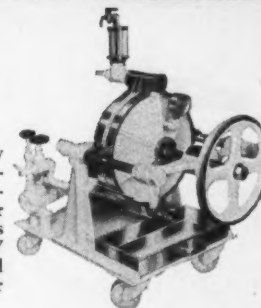
calibrated to 0.0002 reflectance units. Spinning attachment, to permit rotation of samples, is available as an accessory. Manufacturer plans to make available a scale multiplier, to permit scale expansion by factor of 10.

(Colormaster Differential Colorimeter is product of Manufacturers Engineering & Equipment Corp., Dept. CP, Hatboro, Penna. Check CP 4961 opp. last page.)

## Step Up Your Production with ERTEL ASBESTOS DISK FILTERS

### 1. EBW MODEL PORTABLE FILTER

A highly efficient, readily portable filter that meets requirements for smaller capacities. Performance proven over the years in many hundreds of plants. Perhaps Ertel EBW model can economically speed up your production. Ask for full particulars.

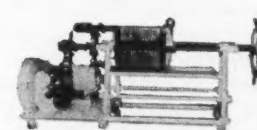
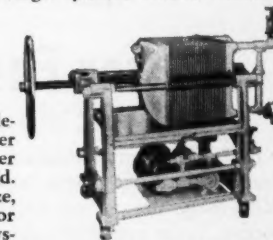


### 2. ECD TWIN MODEL DISK FILTER

Typical of Ertel craftsmanship is this Positive Seal Multi-Purpose Disk Filter. The outstanding feature of independent filtering elements provides positive seal of any type filtering medium. Cylinder prevents loss of liquid—particularly well adapted for volatile liquids as well as many other ordinary filtering requirements. Sizes available to hold from 4 to 30, 12 1/4" dia. asbestos filter disks, filter cloths or filter paper in each cylinder. Single cylinder models available.

### 3. EU MODEL UTILITY FILTER

The Ertel Filter that's designed to use asbestos filter sheets, filter cloth, filter paper or filter cloth and filter aid. Standard units in bronze, nickel plated, stainless steel or hard rubber circulatory system. Comparison and operation records prove the EU Model unmatched in design, versatility and operation-life. Experience has shown that the great majority of filtration problems can be solved by your consultation with our engineers. May we help you?



### 4. EUS MODEL STAINLESS FILTER

Built in sizes to accommodate from 10 to 100 asbestos filter sheets, filter paper or filter cloth. Capacity 5 to 150 gpm. depending upon product.



ASK FOR ILLUSTRATED CATALOG

Describes the complete line of precision built Ertel Liquid Handling Equipment for Industry.

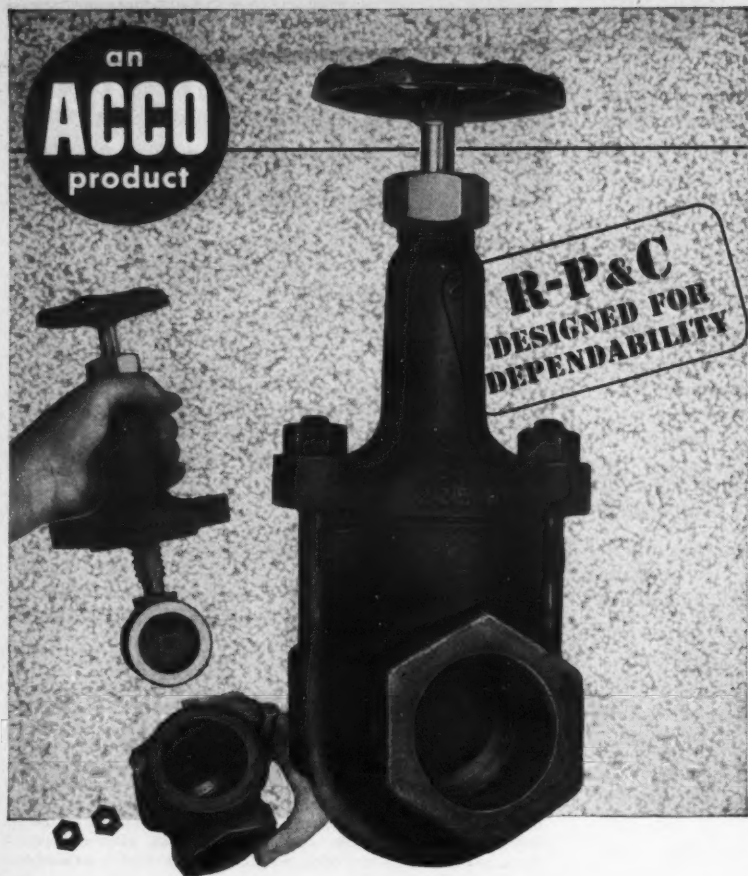
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COMPLETE LINE OF  
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When inquiring check CP 4962 opposite last page



## for Easier Cleaning!

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• R-P&C clip gates were developed specially for those applications in the chemical and petroleum industries where ease of cleaning is a big factor. With these rugged valves you simply remove two nuts, then lift up the bonnet, stem and gate assembly in one piece for easy access to the entire valve body.

Ease of maintenance and sturdy construction make these clip gates preferable over bronze gate valves in many applications. Rated for 150 lbs. steam, or 225 lbs. OWG, clip gates are furnished in sizes from  $\frac{1}{4}$ " to 3", with screwed ends. Normally furnished with bronze trim, they may also be supplied in all-iron for use with fluids which attack bronze.



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Valve selector slide rule gives all dimensions for iron body and steel valves in pressure classes from 150 to 1500 lbs. Write for yours.

All castings used are of close-grain, hi-test gray iron, 50% stronger than ordinary iron, from R-P&C's own foundry. Their construction embodies quality features that are characteristic of R-P&C's complete line of gate, globe, angle and check valves in all of the standard valve materials.

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AMERICAN CHAIN & CABLE**

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**R-P&C  
valves**

When inquiring check CP 4963 opposite last page

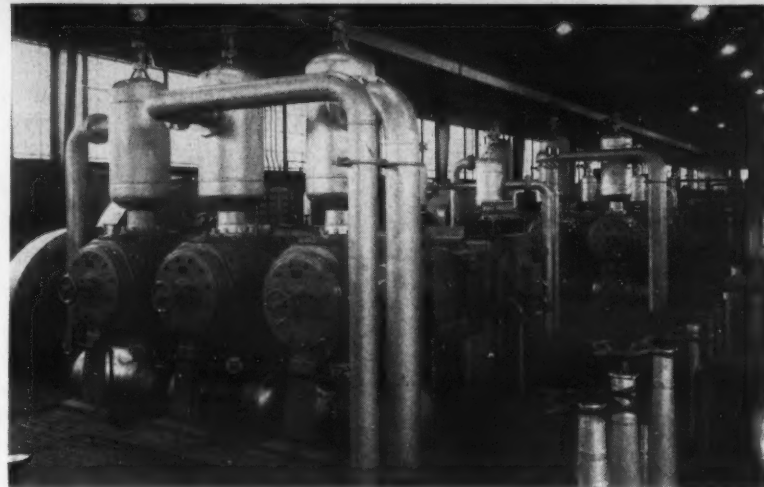


Fig 1—Compressors used for cascade refrigeration system at Atlantic Refining

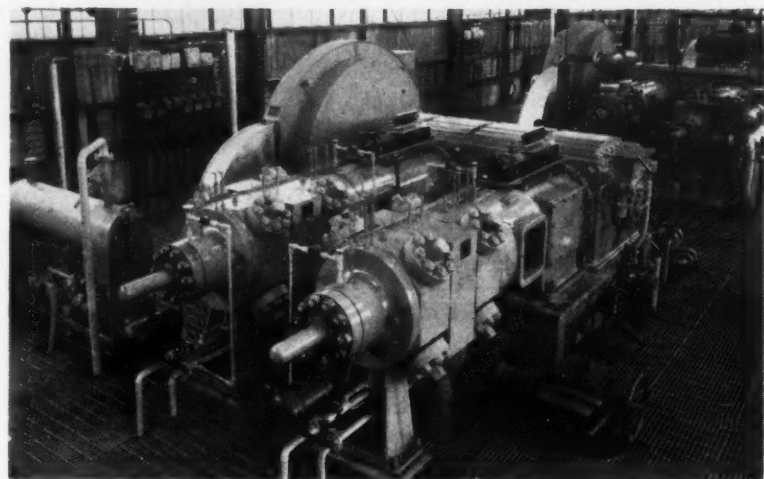


Fig 2—This unit raises pressure of synthesis gas from 2200 to 2500 psi

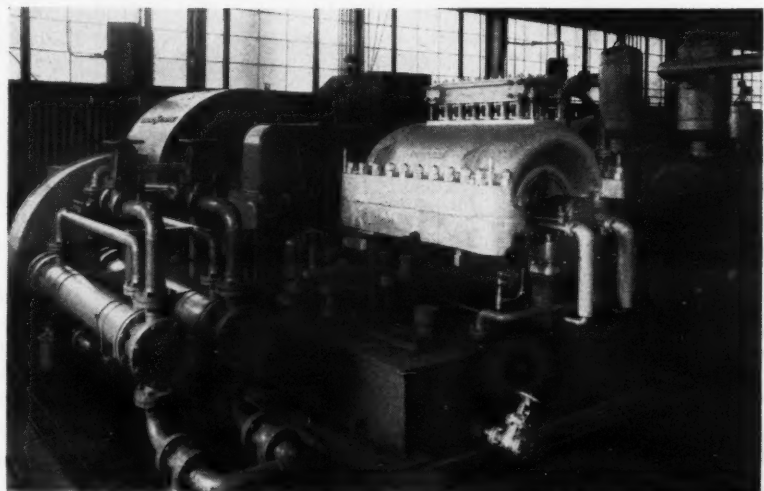


Fig 3—Air at 85 psi is later liquefied for separation of nitrogen



At Atlantic Refining, eight easily accessible, compact units, which are neat in appearance and dependable in operation —

## compress gases for ammonia synthesis

Versatility of compressors is illustrated by one unit which does three jobs in handling propane, methane, and ethylene for cascade refrigeration system

Gordon Weyermuller, Associate Editor  
With W. O. Hoffman  
Superintendent, Chemicals Dept.  
Atlantic Refining Company, Philadelphia, Pa.

Heart of Atlantic Refining's new ammonia plant, the first one on the East Coast to make ammonia from reformer hydrogen, is the compressor installation. The eight units in use take part in all phases of the process and must be dependable in operation to assure uninterrupted production. Compressors — which are compact, easily accessible for maintenance, and neat in appearance — were placed in operation in March 1954.

Each of the compressors is designed for the individual requirements of the ammonia plant. Although frame and running gear of each compressor are standard for its type, cylinder regulation, correct valve size, and other construction details were selected to meet specific requirements. Advantages of the compressors can best be illustrated by explanations of typical units as follows:

**Fig 1—For cascade refrigeration**—Versatility of the compressors is illustrated by this unit, and its companion unit in back. Each of these compressors essentially does three jobs in handling propane, methane, and ethylene for cascade refrigeration system. Each gas is handled by a different pair of cylinders. Only one driving unit, one motor, and one crankshaft are used. In this way, design of compressor permits only one unit to be used where three would be needed.

Each of these compressors has a 15" diameter cylinder for first stage, 7" diameter for second stage, with 12" strokes for both stages. Unit, which utilizes a 450 hp motor, is designated as a 6-HHE-2 type. Each compressor handles gases at pressures varying from 230 to 430 psi.

**Fig 2—For synthesis gas recirculation** — This

compressor operates as a single stage unit to recycle the unreacted synthesis gas (one part  $N_2$  and three parts  $H_2$ ) back to the converter. Pressure of gas is increased from 2200 to 2500 psi.

This compressor is a  $7\frac{1}{2} \times 7\frac{1}{2} \times 14$ , 500 hp, 2-HHE-1 type. It utilizes two motorpumps (one a spare) which operate at 3460 rpm and 90' head to furnish 20 gpm of cooling oil to the packing.

**Fig 3—Air compressor**—This 1750 hp blower supplies 7710 cfm of air at 85 psi which is later liquified by refrigeration to extract pure nitrogen. Unit has seven stages. Each stage has water-jacketed diaphragms. Air comes out of unit at 275° F and is lowered to 80°F with aftercooler. Blower utilizes G-E 1200/7353 rpm speed increasing gear.

The other compressors in use in the ammonia plant of Atlantic are similar to these three or are variations of these basic types. Among other construction details of the units, the short stroke and opposed cylinder design are advantages which help to achieve the compactness and good balance of the compressors and permit a small foundation. Drip lip running around base, absence of dirt catching pockets, and general design are factors in maintaining neat appearance of units.

All main crank pin, crosshead, and crosshead pin bearings are force-feed lubricated for long life. Foreign material is kept out of lubrication system by continuous filtering, which protects bearing surfaces and prevents clogging of oil distribution passages. All bearings are large-size and conservatively proportioned for maximum operating loads.

(Ammonia plant was designed and built by Hydrocarbon Research, Inc., 115 Broadway, New York 6, N.Y.)

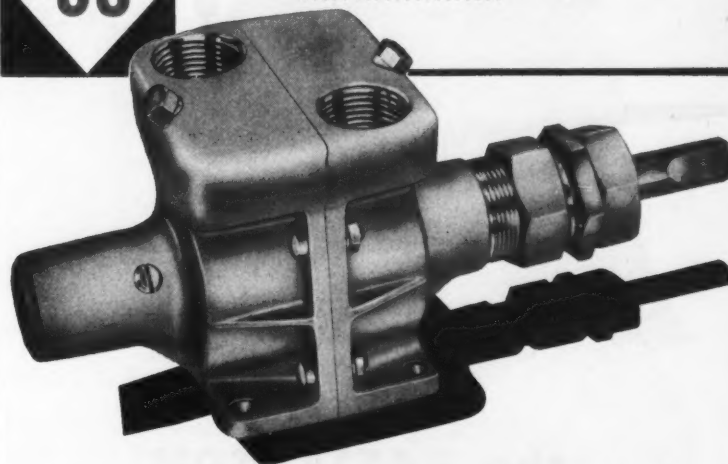
(Compressors are product of Ingersoll-Rand Co., Dept. CP, 11 Broadway, N. Y. 4, N.Y. Check CP 4964 opp. last page.)

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**CHECK these Eco All-Chem® pump features against your needs:**

- Capacities: 1-10 gpm at 1750 rpm, up to 150 psi.
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- Impellers: Teflon, Neoprene, Formica.
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- Positive displacement . . . high suction lift . . . self-priming with non-volatile liquids . . . operates in either direction.
- Drives: Direct motor, V-belt or vari-speed pulley drive.
- Standard parts mass produced and stocked for immediate shipment and for complete interchangeability.
- Adaptable for constant volume transfer, for agitating and pumping shear-sensitive fluids under pressure, and for constant flow metering.
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- Lowest price in its class . . . the most pump and pump performance for your money.



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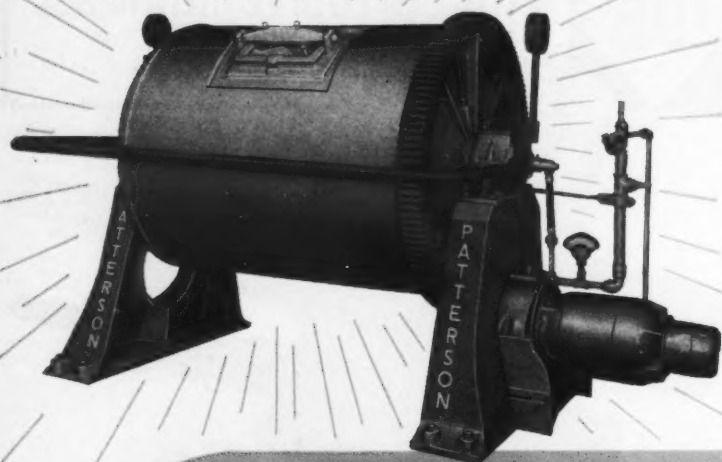
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*Richard L. Cameron*

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**The Patterson Foundry and Machine Company, (Canada) Limited**  
Toronto, Canada  
MONTREAL

When inquiring check CP 4966 opposite last page

## ENGINEERING & MAINTENANCE

### *Physical properties of neoprene found in non-shrinking air-curing putty . . .*

caulking material is unaffected by water or most solvents

**Uses:** Material is designed to be applied as a conventional putty or caulking compound where greater elongation and solvent resistance are required. It is suited for caulking aluminum mullions, other metal panels in building construction, or any place where dissimilar metals come in contact.

**Features:** Putty is non-shrinking, air-curing and possesses the physical and chemical properties of neoprene. It is unaffected by water and most solvents.

**Description:** Material is 100% solids with a neoprene base. Cured composition remains soft and pliable. It may be subjected to repeated elongations, compressions, or flexing without loss of properties. Compound is light in color. It is shipped unaccelerated and must be mixed with accelerator prior to application.

(Gaco N-98 neoprene putty is a product of Gates Engineering Co., Dept. CP, 100 South West Street, Wilmington 99, Del. . . or for more information check CP 4967 on form opposite last page.)

### *Variety of induction heating loads handled by electronic units for industrial use . . .*

heater line complies with FCC regulations

**Uses:** For brazing, soldering, surface hardening, and annealing operations.

**Features:** Total of 16 models in four output ratings with combinations of thyatron power control, built-in output transformer, or tapped-tank coil give induction heater line wide flexibility. Units are adaptable to wide variety of induction heating loads and applications, and are designed and certified to comply with FCC regulations.

**Description:** Heaters are rated  $7\frac{1}{2}$ , 15, 25, and 40 kw output. Filament voltage is regulated with constant-voltage transformer for longer tube life. Voltage regulation of oscillator and rectifier tube filaments maintains voltage within plus or minus 3% of rated value when heaters are operated at specified line voltage.

Interlocked access doors protect operator from high voltage. Oscillator tube and tank circuit is water-cooled, while terminals of oscillator tube and base of rectifier tube are cooled by blowers.

(Induction heaters are a product of Industrial Heating Dept., General Electric Co., Dept. CP, Schenectady 5, N.Y. Check CP 4968 opposite last page.)

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When inquiring check CP 4969  
opposite last page

CHEMICAL PROCESSING

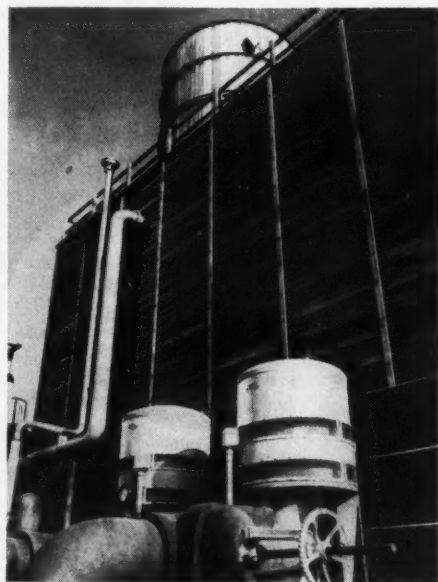


### Permanent magnet materials and their selection

Magnetic characteristics, applications and design factors, material characteristics, and manufacturing methods and shape limitations of permanent magnet materials, presented in a selector chart for convenient reference, are feature of 12-page manual. Materials discussed include: cast and sintered Alnico, Indalloy, and Indox, ductile and malleable alloys, and formed chrome and cobalt steels.

Other items included are hysteresis loops and demagnetization curves, temperature limitations, directional properties, incremental permeability, and hysteresis loss. A glossary of magnetic terms is given.

Manual No. 5-R is available on letterhead request to The Indiana Steel Products Co., Dept. CP, Valparaiso, Ind.



Baffles baffle dust

Dust or air-borne moisture particles cannot reach induction motors driving cooling tower pumps at U.S. Industrial Chemical's Tuscola, Illinois ammonia plant. Baffles contained in steel plate enclosures cause particles to drop out of air stream while still in air passages. Installation supplies water at 10,000 gpm.

(Motors were supplied by Electric Machinery Mfg. Co., Dept. CP, 1331 Tyler St. NE, Minneapolis 13, Minn. . . or for more information check CP 4970 on form opposite last page)

## GET BALANCED CORROSION- RESISTANCE

### with money-saving "CAUSUL" METAL VALVES

"Causul" Metal bodies and bonnets are far less expensive than the high alloys — but offer much better resistance to corrosion than cast iron or bronze. Trim is available in Type 316 Stainless Steel or Monel Metal, providing the best corrosion-resistance obtainable in the seats, discs, and stems. With this combination, you get excellent service at minimum cost . . . corrosion-resistant valve service that saves you money.

#### NOW WITH HEAVIER, STRONGER BODIES!

"Causul" Metal Valves are now made with heavier, thicker body walls for extra strength and durability. Castings are poured in a foundry specializing in handling this alloy.

#### NOW IN A GREATER RANGE OF SIZES!

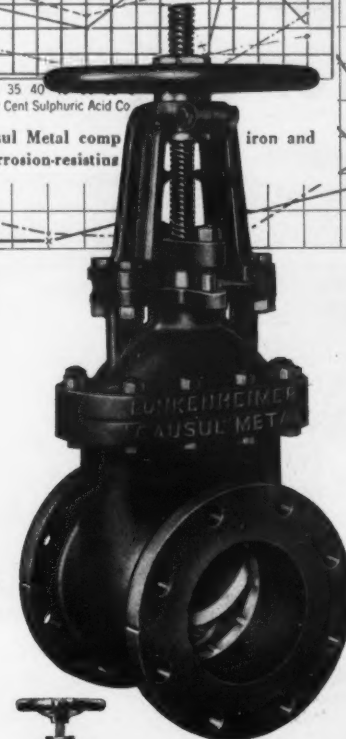
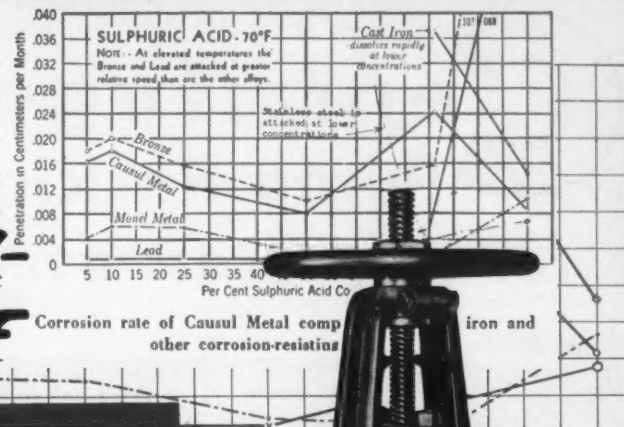
"Causul" Metal Valves are now made in a complete size range — ½ to 2 inch, screwed ends . . . 1 to 8 inch, flanged ends — with both Monel and Stainless Steel trims.



"CAUSUL" METAL is an exclusive Lunkenheimer development — containing iron, nickel, copper, chromium, and molybdenum. For detailed service recommendations, request a Confidential Service Information Form from your Lunkenheimer Distributor, or write to The Lunkenheimer Company, Box 360, Cincinnati 14, Ohio.

# LUNKENHEIMER®

THE ONE *Great* NAME IN VALVES



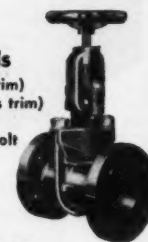
#### Screwed Ends

Fig. 2008-8 (Monel trim)  
Fig. 2008-4 (Stainless trim)  
½ to 2 inches



#### Flanged Ends

Fig. 2009-8 (Monel trim)  
Fig. 2009-4 (Stainless trim)  
1 to 1½ inches  
2 to 3 inches—Two-Bolt Bonnet Design



#### Flanged Ends

Fig. 2009-8 (Monel trim)  
Fig. 2009-4 (Stainless trim)  
4 to 8 inches

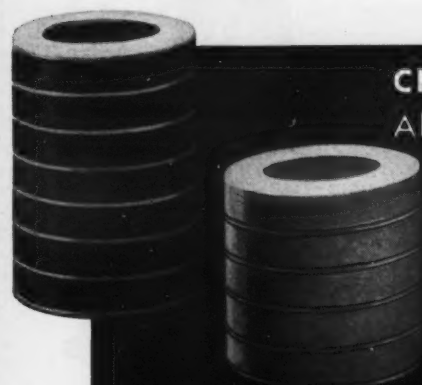


BRONZE • IRON  
STEEL • PVC VALVES

L-355-11

When inquiring check CP 4971 opposite last page

# Centrifugal Pump Packing for all process needs



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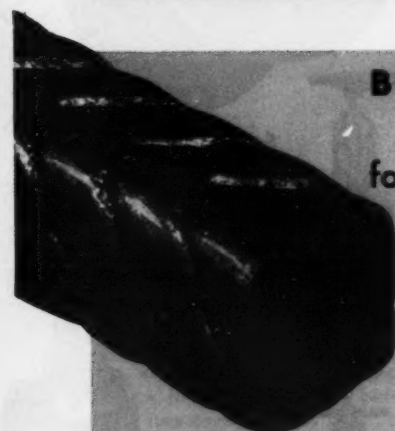
Made in two types—pure duPont TEFLON, No. 711-O, and TEFLON with Graphite, No. 711-G.

Handle all types of corrosives including hazardous chemicals. Also ideal for non-contaminating service in the manufacture of pharmaceuticals, biologicals, foods, etc.

Outlast other type packings in chemical service, many times over.

Write for U. S. Gasket Catalog No. TP-1255 on Engineered Valve and Pump Packings

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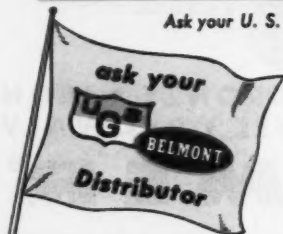
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Ask your U. S. Gasket- Belmont Distributor or write for literature.



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The Belmont Packing & Rubber Co.  
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# U.S. GASKET • BELMONT PACKING

When inquiring check CP 4972 opposite last page

## ENGINEERING

**Change seat material or shut-off direction quickly, easily . . .**

ball valve need not be removed from line

**Uses:** Flow control for oxygen, LP gas, or chemical lines in processing, refineries, or allied industries.

**Features:** Top entry ball valve has cage assembly which allows change in direction of shut-off, change of seat material, or cleaning to be accomplished quickly and easily. Valve does not have to be removed from line.



Cleaning of valve can be done quickly and easily

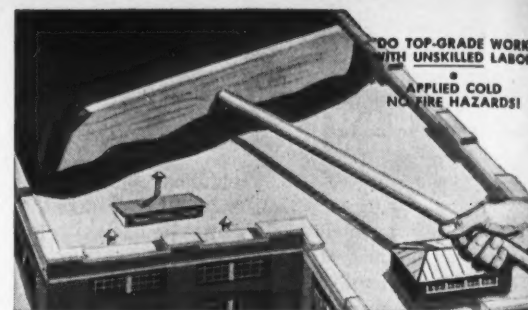
**Description:** Seats can be furnished in Buna-N, Kel-F, Teflon, and nylon. Construction is of bronze. Valve is rated at 300 psi for water, oil and gas and 400 psi on LP gas. Sweat ends and screw ends in sizes 1/2, 3/4, and 1" are available.

(Top entry ball valve is a product of Rockwood Sprinkler Co., Dept. CP, 38 Harlow St., Worcester 5, Mass. . . or for more information reader may simply check CP 4973 on the convenient Reader Service slip located opposite last page.)

**Lists data, dimensions for packaged boilers**

Packaged water tube boilers in capacities to 50,000 lb of steam/hr are covered in 12-page brochure. Capacities and dimensions are listed.

Cat 121-D is issued by Superior Combustion Industries, Inc., Dept. CP, 1475 Broadway, New York 36, N.Y. When inquiring reader may simply check CP 4974 on form which is located opposite last page.



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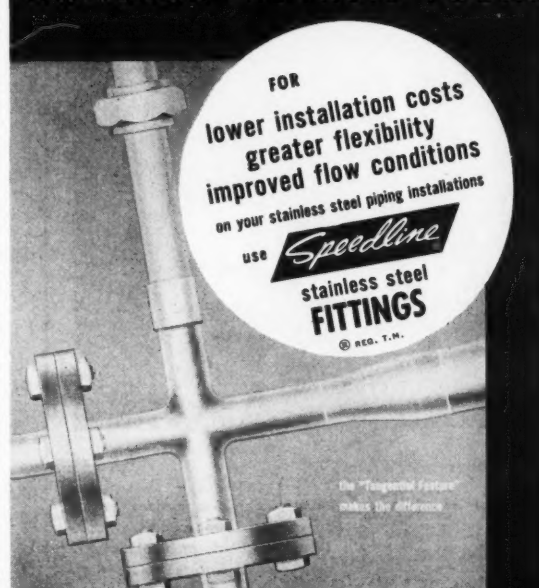
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When inquiring check CP 4975 opposite last page

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CHEMICAL PROCESSING

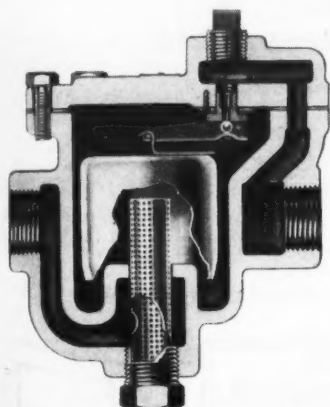


**Loss of prime prevented  
in bucket steam trap  
by valve design . . .**

powerful lever action insures  
quick opening

*Uses:* Steam line service subject to light loads, rapid pressure drops, and partial vacuum in return line caused by night shut-downs.

*Features:* Valve mechanism in inverted-bucket steam trap makes use of lever action to insure quick opening and large discharge capacities which prevents loss of prime.



Steam trap design permits high discharge capacity without increasing size

*Description:* Unit is compact and available in capacities from 446 to 20,500 lb of condensate per hour. Lever action provides force needed to open trap's large valves against steam pressure to permit retention of priming condensate. Lever force is provided by arm connection between floating bucket and valve lift mechanism. Bimetal air vents are available where required.

(Inverted-bucket steam traps are a product of Sarco Company, Inc., Dept. CP, Empire State Bldg, New York 1, N.Y. Check CP 4977 on form opposite last page.)

For more information on product at right, specify CP 4978 . . . see information request blank opposite last page. ➡



second in a series . . . **CHEMICAL STABILITY**

Comparative stability of MONOFRA<sup>®</sup> fused cast refractory (left) vs. fireclay (right) . . . under attack by molten glass, as viewed through the high tempera-

ture microscope — one of Carborundum's most useful test facilities. (16 mm. frames shown are not consecutive.)

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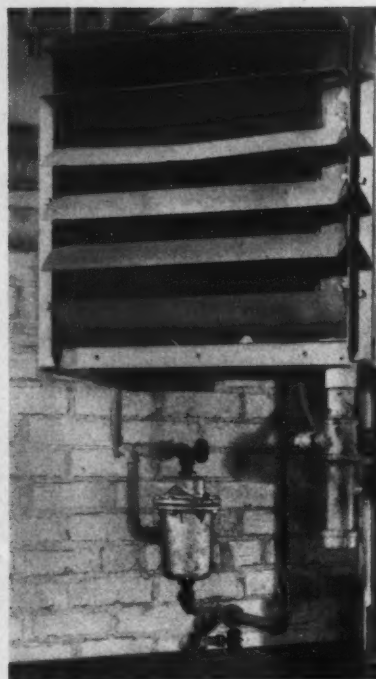
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## CARBORUNDUM

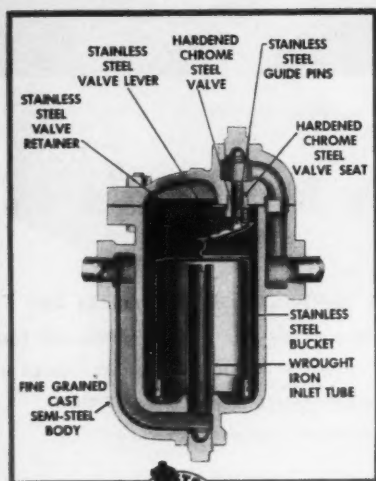
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# Major Chemical Company Reports Armstrong Traps Cost Less to Maintain



◆ **INDOORS**—Mr. George Gentes, Works Manager at Hooker Electrochemical Co., Tacoma, Wash., says, "We feel that we get excellent service with Armstrong traps. We have been using them for about 10 years."

◆ **OUTDOORS**—these Armstrong traps give year 'round service at Hooker's big Tacoma plant.



**Trap's Lot is a Hard One.** A steam trap takes a lot of punishment. On some jobs it may operate 1,000,000 times a year. The parts are subjected to dirt, scale and corrosive substances, high temperatures and the erosive action of the condensate.

**Armstrong's Take it Well.** Armstrong traps endure these conditions remarkably well. In reporting on less trap maintenance since installing Armstrong traps Mr. George Gentes, Works Manager of Hooker Electrochemical Company's plant at Tacoma, Washington stated:

"We get excellent service . . . our

trap maintenance cost is very low."

**Others Agree.** More Armstrong customers mention low maintenance than any other single benefit. That means more than low repair costs. It means freedom from leaky traps that waste steam, freedom from faulty traps that slow up production—freedom from trouble.

**A Suggestion.** Send for the Armstrong Catalog listed below or, better yet, call your local Armstrong Representative or Distributor—he's exceptionally well qualified to help you improve your trapping situation.

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Simple, dependable Armstrong traps mechanisms have only two moving parts—bucket and lever. Design, materials and workmanship in low and medium pressure traps identical to that of traps for 900 lbs., 900°F service!

When inquiring check CP 4979 opposite last page

## ENGINEERING & MAINTENANCE

### Selection of industrial fans

Specifications and important considerations in selecting fans for industrial air and material handling requirements are discussed in 72-page, two-color, illustrated catalog. Among topics covered are: wheels and arrangements, optional construction, and special design construction details for high temperature operation. Elevated temperature application guide offers recommendations for bearings, fan construction, fan arrangement, and maximum speed factor.

Fan selections based on constant pressure method as well as cold static method are given with example selections included for each case. A typical industrial fan specification is shown as a guide to buyers and users, with a step-by-step outline of data which should be included.

Bul 5306 is issued by American Blower Div., American Radiator and Standard Sanitary Co., Dept. CP, Detroit 32, Mich. When inquiring specify CP 4980 on form which is located opposite last page.



"For Pete's sake, why don't you throw a bucket of water on that floor?"

Idea for the cartoon above was sent to us by Leslie Rajkay, an employee of Fuld Bros., Baltimore, Md. He's \$5 richer because of his efforts.

Your cartoon ideas can make money for you, too. See details on page 23, this issue.



## NOW — A Complete Range of HIGH TONNAGE SPRAY DRYERS Described in One Interesting Bulletin



Write for your personal copy of Bulletin 32 and get the facts you should know about these specially engineered Bowen Spray Dryers

Bowen can furnish comprehensive cost estimates for products requiring specially engineered dryers to meet any special product characteristics. Design data can readily be obtained by running tests on one or more of the various Spray Dryers in the Bowen Laboratory. Thus, desired product characteristics can be assured before the investment in any equipment, and limited

quantities of the product can be run for market sampling and testing.

Bowen is fully equipped to design, build and erect spray dryers to produce any quantity of product. The extensive Bowen Laboratory is centrally located and you are cordially invited to visit with Bowen engineers and see Bowen Spray Drying Equipment in operation.



Recognized Leader in Spray Dryer Engineering Since 1926  
**BOWEN ENGINEERING, Inc.** NORTH BRANCH, NEW JERSEY

When inquiring check CP 4981 opposite last page

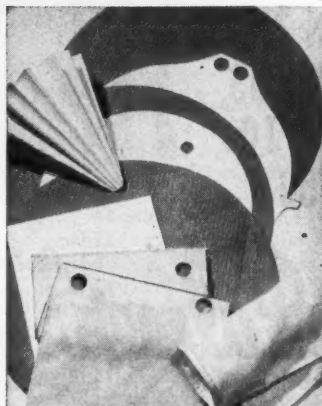
## for YOUR particular filter requirements . . .

### FILPACO FILTER MEDIUM

will help you on any filter media requirement . . . we invite your inquiry.

**FILTER PAPER**  
quickest service, latest converting equipment and most complete range of grades guarantees filter paper to meet any requirements. **SAMPLES FURNISHED** for testing . . . or send us your materials for testing.

**FILTER CLOTH**  
cotton, wool felt, metal mesh, glass, orlon, nylon, silk, vinylon, saran and many other synthetics cut and sewn to required shapes and sizes . . . variety of weaves, weights, finishes.



**ASBESTOS PADS**  
furnished in a variety of grades and filtering characteristics . . . sizes and shapes for your needs.

We invite your inquiry.



**FILPACO INDUSTRIES**  
The FILTER PAPER CO.

2432 S. Michigan Avenue, Chicago 16, Illinois

Tear out this ad and send for complete, free information

When inquiring check CP 4982 opposite last page

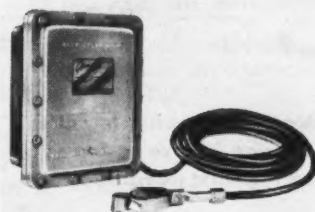
## ENGINEERING

When electrical ground is complete, device tells you so . . .

indicator produces radio signal

**Uses:** Provides a positive means of grounding static electricity that may accumulate before and during loading and unloading operations of tank cars, trucks, and transports.

**Features:** When ground is made, instrument produces a small radio signal that can be used to light a pilot lamp, start pump, or operate



Ground indicator can be used with explosive substances

other items. Electronic ground indicator has been approved and listed by Underwriters' Laboratories for use with hazardous substances.

**Description:** Ground indicator is essentially a balanced bridge circuit with an electronic tube power source. Unit has explosion-proof cast aluminum case for mounting. Twenty-five feet of standard heavy-duty cable is supplied with large alligator clip.

(Gilbarco Indicator is a product of Gilbert and Barker Mfg. Co., Dept. CP, W. Springfield, Mass. Check CP 4983 opp. last page.)

### Magnetic separation discussed

Method of operation, specs, and features of magnetic separator for machine tool coolants are discussed in 4-page folder.

"Roto-Flo 15" is issued by Industrial Filtration Div., U.S. Hoffman Machinery Corp., Dept. CP, 105 Fourth Ave., New York 3, N.Y. Specify CP 4984 opposite last page.



**ACIDS, CORROSIVES AND  
SOLVENTS**



**HOT LIQUIDS**



**TOXIC GASES AND VAPORS**

**JOHN CRANE**

**TYPE**

**9**

**MECHANICAL SEAL**

# WILL HANDLE THEM ALL!

Wedge and sealing rings molded from DuPont Teflon assure efficient, safe handling of all known industrial chemicals and corrosives at temperatures varying from  $-120^{\circ}\text{F.}$  to  $+500^{\circ}\text{F.}$  Spring and metal parts are furnished in the metallurgical specification best suited to the particular service. In every way, you get a mechanical seal that is "John Crane" engineered to your requirements—no matter how tough!

The Type 9 Seal has and continues to solve innumerable problems where difficult-to-handle liquids and gases are involved . . . at pressures up to 750 psi. It can do the same for you.

Use the Type 9 Seal on all rotating shaft equipment—centrifugal and rotary pumps, mixers, agitators, autoclaves, other equipment.

**REMEMBER:** Your toughest problem can be the Type 9's next success story. Send for full details today.

Crane Packing Co., 6421 Oakton St., Morton Grove, Ill. (Chicago Suburb).

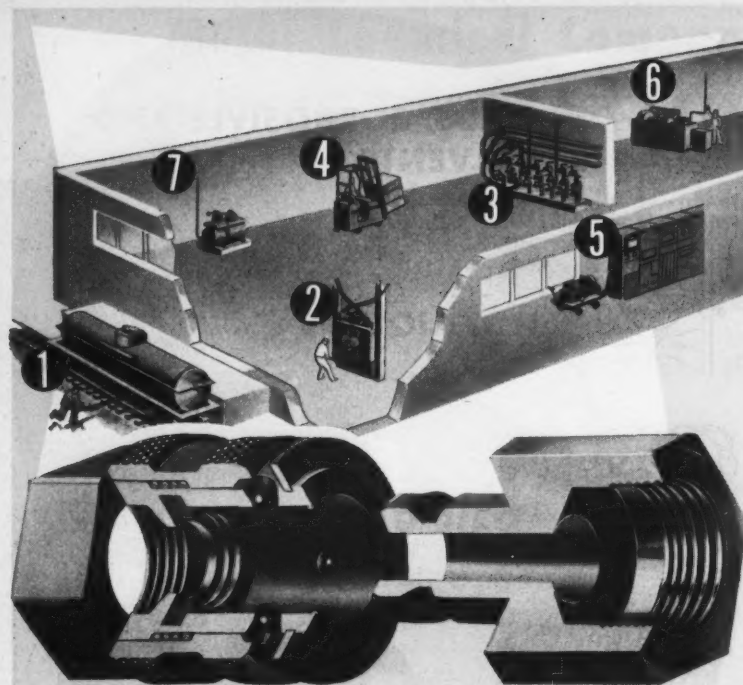
In Canada: Crane Packing Co., Ltd., Hamilton, Ont.



**CRANE PACKING COMPANY**



When inquiring check CP 4985 opposite last page



whatever the operation . . .

## Titeflex Quick-Seal Couplings for fast, leakproof connections!

Everywhere in industrial operations, you find Titeflex Quick-Seal Couplings "making connections"! And what connections! Absolutely leakproof. Couple or uncouple in one second. Allow free flow of any material. Sizes 1/4" to 12".

See drawing for typical uses. Then check your own plant for trouble spots where Quick-Seal Couplings can serve you profitably. For details . . . send coupon.

- |                               |                            |
|-------------------------------|----------------------------|
| 1 Tank Car Unloading          | 5 Mobile Testing Equipment |
| 2 Furnace Doors               | 6 Machine Cleaning         |
| 3 Blending "Switchboards"     | 7 Air Lines for Tools      |
| 4 Lift Trucks—Hydraulic Lines |                            |

**Titeflex**

TITEFLEX, INC. (Industrial Products Div.)  
509 Hendee Street, Springfield, Mass.

Send me your free Quick-Seal Couplings Catalog—don't obligate me.

Name \_\_\_\_\_ Title \_\_\_\_\_

Firm \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

**Titeflex Quick-Seal Couplings • Leakproof at all operating pressures, in every application**

When inquiring check CP 4986 opposite last page

## ENGINEERING

### Steel products described

Company's operating divisions and subsidiaries, together with the products they produce, are described in 12-page, pocket-size brochure. A discussion of research and development activities and measuring and testing equipment is included.

"American Steel Foundries" is available from American Steel Foundries, Dept. CP, 410 N. Michigan Ave., Chicago 11, Ill. When inquiring specify CP 4987 on form which is located opposite last page.

### Neoprene rubber impeller, bearing bronze casing on low-cost pump . . .

designed for low-pressure transfer of liquids

**Uses:** Low-pressure transfer of any liquid that does not affect bronze or neoprene.

**Features:** Pump has neoprene rubber impeller mounted on stainless steel shaft. Casing is of bearing bronze. Unit is designed to provide low-cost pumping of liquids in pressure range to 30 psi.

**Description:** Impeller pumps are available from 3/8" to 1 1/4" ips



Impeller pump can be operated in either direction

with flow ranges to 55 gpm. It is self-priming to about 15-20 feet when wet. Speeds range from 100 to 1750 rpm and pump operates with standard high starting torque motors from 1/3 hp up depending

## NO MATTER WHAT YOUR LEAKING JOINT PROBLEMS ARE



Leak Lock clings in tough films that stretch rather than break

IT MAY PAY YOU  
TO TRY LEAK LOCK  
LIKE OTHER  
MAINTENANCE MEN  
HAVE DONE

For 5 years, Leak Lock has been surprising skeptical people who didn't expect to find a "barrier" for an "impossible-to-hold" material. They were surprised at the broad scope of its capabilities.

Leak Lock is being ordered regularly by a well-diversified list of important concerns who regard it as a "find" for special uses.

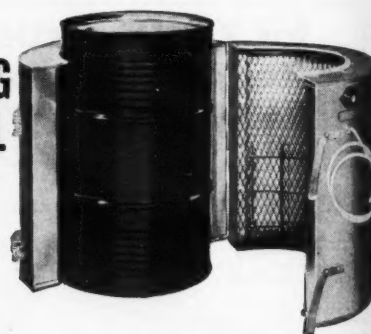
Send for information and a sample. And here's a tip: Don't depend on a lab. test. Try it on the actual job, and then you will know.

**Leak Lock**

STEWART INDUSTRIES, INC.  
(FORMERLY HIGHSIDE CHEMICALS CO.)  
16 COLFAX AVENUE CLIFTON, N. J.

When inquiring check CP 4988 opposite last page

WARMS  
ANYTHING  
IN METAL  
DRUMS  
UP TO  
450°F



**Palmer** Automatic  
**DRUM  
WARMER**

A PORTABLE ELECTRIC OVEN in two models for 55 or for 30-gallon steel drums.

Saves Time—Saves Money. Makes removal from drum by dipping, pouring or pumping, easy and convenient, for any viscous material that handles better when warm.

Operates automatically and economically. Two hinged halves, well insulated, fit around drum at point of use—eliminates handling hot drums. Supplied for 115, 208, 230 or 460 volts, single, or three phase. Catalogue, prices and specifications on request. Write today!

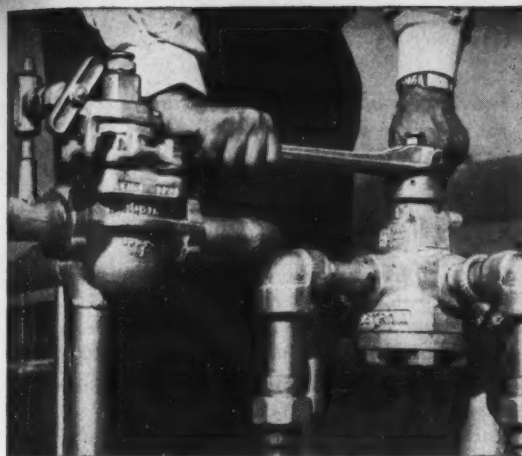
HAROLD L. **Palmer** COMPANY

2980 West Davison Ave., Detroit 38, Michigan, Phone TUlse 3-1100

When inquiring check CP 4989 opposite last page

CHEMICAL PROCESSING





## JUST ONE Rockwell-Nordstrom Multiport Valve Does the Work of 2, 3 or 4 Ordinary Valves

For multiple flow control, you can switch from one line to another *instantly* by operating only one Multiport valve—instead of 2, 3 or even 4 ordinary valves. Just three of the many possible switching combinations are diagrammed below.



In addition to original installation savings, Multiport valves continue to save because they're built to *stay* efficient. *Pressurized lubricant* forms a positive seal between the plug and body and also protects against corrosive-erosive elements. The seat is *never* exposed to the line fluid and the plug rides on a cushion of lubricant for *instant, quarter-turn* operation.

Rockwell-Nordstrom Multiport valves (and the complete line of *Straightway* patterns) are available in semi-steel, stainless steel, bronze and other corrosion resisting metals. Write for complete details: Rockwell Manufacturing Company, Pittsburgh 8, Pa. *Canadian Valve Licensee*: Peacock Brothers Limited.



**Rockwell-Nordstrom Valves**  
LUBRICANT SEALED FOR POSITIVE SHUT-OFF  
40th YEAR of lubricated plug valve leadership

on model. Unit can be operated in either direction.

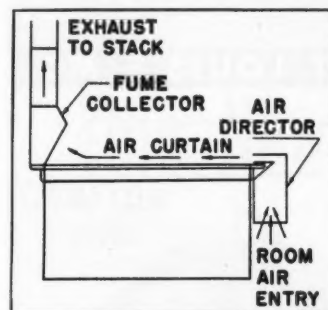
(Impeller pump is a product of American Machine Products, Inc., Dept. CP, 172 Centre St., New York 13, N.Y. Check CP 4991 opposite last page.)

### More efficient ventilation of tanks which emit noxious fumes . . .

combined air director, exhaust reduces vapor volume handled

**Uses:** Ventilating plating, anodizing, pickling, and other tanks which emit noxious or otherwise undesirable fumes.

**Features:** Combination of air director and exhauster reduces volume of vapor that must be handled

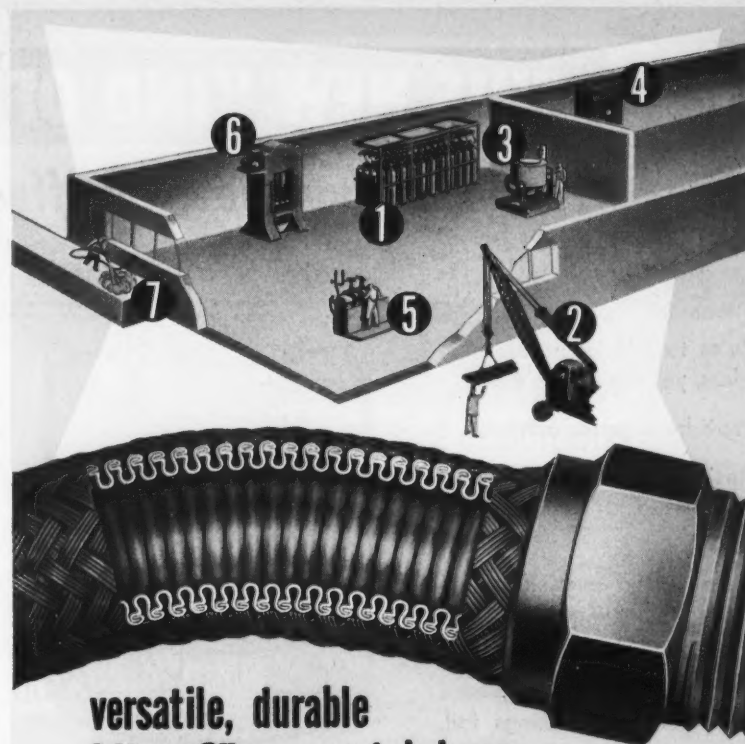


Fume removal system minimizes room heat loss

by providing an air current across a tank surface thereby directing fumes into collector hood. System minimizes room heat loss, and saves power.

**Description:** Systems are available in solid plastic, steel, or steel-lined or coated construction. Director, a compact air supply unit, contains its own motor and blower. Collector hood, up-draft or down-draft, together with director will properly ventilate a tank as wide as six feet. Units are supplied in convenient pre-engineered standard sizes.

(Air-Saver fume removal system is a product of Heil Process Equipment Corp., Dept. CP, 12901 Elmwood Ave., Cleveland 11, Ohio. Check CP 4992 opp. last page.)



## versatile, durable Titeflex metal hose . . . for every type of processing operation

Can take grueling punishment from corrosive fluids, high temperatures, excessive vibration and pressures . . . or from any combination of these industrial *spoilers*. All-metal construction. Wide range of sizes. Braided or unbraided. Choice of alloys and fittings to meet *every* need.

Titeflex Metal Hose finds many important jobs *everywhere*. Investigate your processing operations now and see where Titeflex Flexible Metal Hose can work for you. Send in coupon for important additional information *today*.

- |                          |   |
|--------------------------|---|
| ① Fire Extinguisher      | ⑤ Milling Machine                       |
| ② Air Control Lines      | ⑥ Hydraulic Press—<br>Lubricating Lines |
| ③ Cleaning Vats          | ⑦ Steam Lines                           |
| ④ Air Conditioning Units |   |

**Titeflex**

TITIFLEX, INC. (Industrial Products Div.)  
509 Hendee Street, Springfield, Mass.

Send me your free Titeflex Flexible Hose Catalog without obligating me.

Name \_\_\_\_\_ Title \_\_\_\_\_  
Firm \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

**TITIFLEX FLEXIBLE METAL HOSE licks**

corrosion  
temperature  
vibration  
pressure

in all industrial  
operations

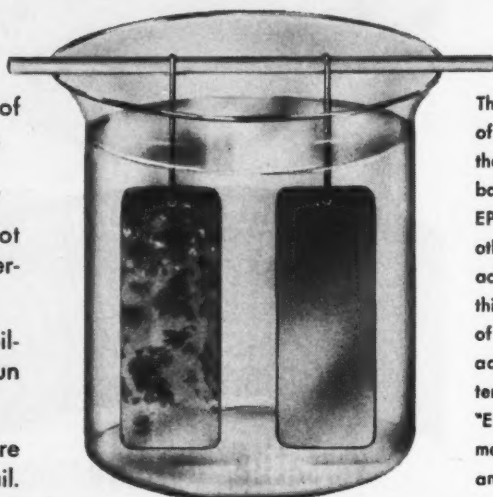
When inquiring check CP 4993 opposite last page



## THIS NEW KIND OF PAINT

**stronger than steel--unaffected by chemicals!**

- Dries to 75% of hardness of glass, yet never gets brittle.
- Provides superior adhesion.
- Resists corrosive gases, hot caustics, acids and temperatures.
- Gives baked enamel durability with brush or spray gun application.
- Protects and beautifies where all other type coatings fail.



The picture on the left shows two pieces of metal submerged in acid. One is bare, the other is coated with EPO-LUX. The bare metal is being eaten up, but the EPO-LUX is completely protecting the other metal and is itself unaffected by the acid. In industries all over the country, this type coating is setting new standards of adhesion, durability and resistance to acids, alkali, salts, solvents, weather, temperatures and 68 chemicals. The word "EPO-LUX" written on your letterhead, mailed to us, will bring you specification and use data. WRITE DEPT. 8

**STEELCOTE MFG. CO. • 3418 GRATIOT • ST. LOUIS 3, MO.**

When inquiring check CP 4994 opposite last page

## FREE TEST CAN

**SAMPLE CAN**  
shows how C-5 solves  
"HIGH-TEMP"  
THREAD PROBLEMS!

Prove it to your own satisfaction that C-5 ENDS  
STUD SEIZING AND GALLING EVEN AT 1800° F



Leading petroleum processors are now using C-5 for flange bolts, studs, and all other threaded surfaces on reactors, cat crackers, auto-claves, heating exchangers, catalytic reformers, pumps and valves, etc., and other applications where temperatures are up to 1800° F. Fel-Pro's exclusive C-5 colloidal copper formula "copper-plates" metal... gives maximum cushioning and protection to 1800° F. without breakdown.

C-5 prevents galvanic action—eliminates pitting even where dissimilar metals are joined... protects all threaded surfaces, insuring their repeated re-use!

Write today for your FREE Test Sample CAN. Felt Products Mfg. Co., 1515 Carroll Ave., Chicago 7, Ill.

**fel-pro**

**"HIGH-TEMP"**

- ✓ Prevents Stud Breakage
- ✓ Ends Stainless "Pitting"
- ✓ Reduces Torque
- ✓ Speeds Disassembly

**ANTI-SEIZE THREAD COMPOUND**

When inquiring check CP 4995 opposite last page

## Got Sealing Troubles?

**ROTARY UNION**  
(Trade Name—Patented)

ROTARY UNIONS solve the rotating sealing problems on applications for manufacturers all over the world. The 40 standard types and sizes of the ROTARY UNION cover almost every application where rotating equipment must be heated or cooled. PSC engineers will be glad to work with you on unusual applications. Contact our nearest office or write for Bulletin 700C.

**Pipe sizes 1/4" through 3"**  
**Self-Aligning • Self-Adjusting**  
**Ball Bearing • Precision Mechanical Seal**  
**"Where Good Connections Count"®**

**PERFECTING SERVICE CO.**  
334 Atlando Ave. Charlotte, N. C.  
Baltimore—Camden, N. J.—Chicago—Cleveland—Los Angeles—New York—Providence—Montreal—Toronto

When inquiring check CP 4996 opposite last page

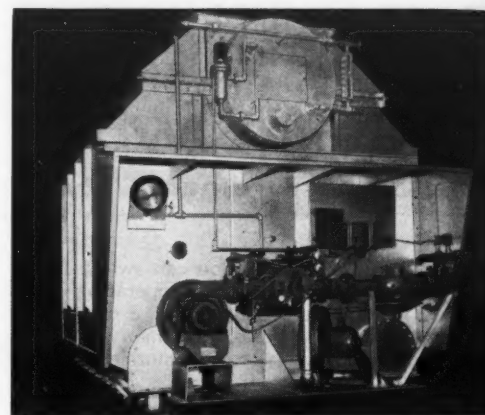
## ENGINEERING & MAINTENANCE

**Provides broad temperature range for accurate process heating at low pressure . . .**

vaporizer can handle Dowtherm A or E, Anisole, or para-cymene

**Uses:** Providing process heating in range from 3,700,000 to 15,000,000 Btu/hr. Vaporizers are completely assembled and shipped as packaged units for indoor or outdoor installation.

**Features:** Vaporizers are designed for use with Dowtherm A or E, para-cymene, or Anisole to provide accurately controlled temperatures over a broad range. Extremely high temperatures can be obtained at low pressure utilizing these heating media. Control is simple, sensitive, and uniform.



Vaporizer line meets heating requirements from 3,700,000 to 15,000,000 Btu/hr

**Description:** Units are compact, 3-drum design furnished for heating with oil, gas, waste heat, or special fuels. They operate with a slight positive pressure in the furnace. Straight-through gas flow over tube banks requires furnace baffles only. Straight line tube pattern provides high heat transfer without high draft losses.

(MH packaged vaporizer is a product of Union Iron Works, Dept. CP, Erie, Pa. . . or for more information check CP 4997 on form which is located opposite last page.)

## Describes lightweight air motor

Rotary air motor weighing only 17 lb is described in two-page data sheet. Performance curves and data, together with construction specifications and advantages, are included.

Bul 855-12 is issued by Gast Manufacturing Corp., Dept. CP, P.O. Box 117N, Benton Harbor, Mich. When inquiring specify CP 4998 on form opposite last page.

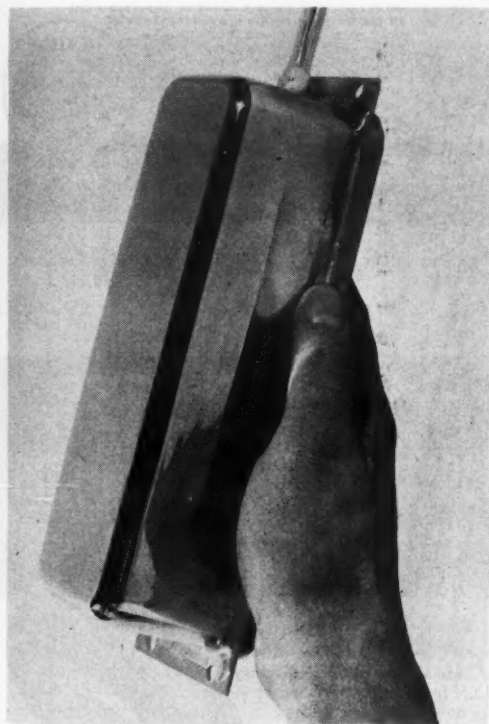


**Range of ultrasonic applications  
increased by design and cost  
of power transducer . . .**

particularly suitable for metal cleaning jobs  
such as removal of carbon smut

**Uses:** Application of ultrasonic energy to a variety  
of processes.

**Features:** Large, uniform radiating surface of  
transducers and modular design facilitate a wide  
choice of arrangements to permit ultrasonic energy  
of proper intensity to be applied as required. Gen-  
erator-transducer combinations provide radiating  
areas in the cost range of \$14 to \$23 per square  
inch of radiating surface.



Modular transducer design facilitates wide choice of  
arrangements

**Description:** Units are available with radiating  
areas of 30 sq in to 8 sq ft. Generators operate at  
40 kc/sec. Applications include metal cleaning such  
as removal of buffing compounds, radioactive con-  
tamination, soldering flux, or carbon smut, in addi-  
tion to other processes in liquids which benefit from  
ultrasonic energy. Ultrasonic power transducers are  
hermetically sealed.

(Ultrasonic power transducers and generators are a  
product of Branson Ultrasonic Co., Div. of Branson  
Instruments, Inc., Dept. CP, 194 Richmond Hill  
Ave., Stamford, Conn. . . or for more information  
check CP 4999 on form opposite last page.)

Are you driving machinery under these **Motor killing conditions?**

**Dust-laden air**

**Corrosive conditions**

**Explosive vapors**

**Flood-out danger**

**This New BJ Mechanical Drive Motor  
solves these problems!**



The BJ Mechanical Drive Motor is  
available in sizes from 5 to 450 HP,  
4 pole, and can be supplied to meet  
the special torque or horsepower and  
speed requirements of any particular  
application. Write for special BJ  
Mechanical Drive Motor information.

**BJ**

**Byron Jackson**

Division of Borg-Warner Corporation  
P. O. Box 2017A, Terminal Annex  
Los Angeles 54, California

Where difficult operating conditions make the use of a  
conventional open-wound motor either extremely  
impractical or hazardous, your best answer is the BJ  
Mechanical Drive Motor. Designed for the most rig-  
orous use, this totally enclosed motor is filled with oil  
and mechanically sealed to make it impervious to any  
external condition. There is no possibility of sparking,  
corrosive attack, flooding out or "loading up." If you  
are driving machinery in mining, milling, refining or  
other industrial applications where these "motor killing"  
conditions exist you owe it to yourself to investigate  
the BJ Mechanical Drive Motor. It is a proven product  
of Byron Jackson's more than 20 years experience in  
the design and manufacture of oil-filled, sealed electric  
motors.

When inquiring check CP 5000 opposite last page

## THE COMPLETE LINE OF

# CAMCO

Forged

## Stainless Steel Fittings

...high in performance

because CAMCO insists on

## Quality!

ONE SOURCE FOR ALL YOUR  
STAINLESS FITTING REQUIREMENTS

Screwed Flanged Welding

MAIL  
TODAY

CAMCO Products, Inc. 445 State Street  
North Haven, Conn. CP

Gentlemen:

- ☐ Please send Flange Dimensional Slide Rule.
- ☐ Catalog No. 653 covering complete line.
- ☐ Furnish address of area distributor.

Name ..... Company .....

Address .....

City ..... State .....

445 STATE STREET  
NORTH HAVEN, CONN.

PRODUCTS, INC.

When inquiring check CP 5001 opposite last page

## ENGINEERING

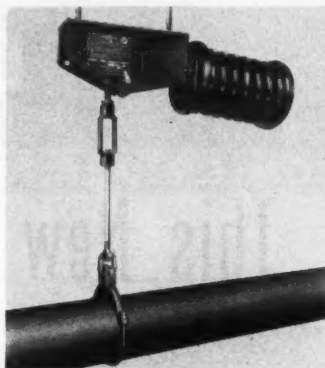
Provide greater travel,  
increased support  
on pipe hangers . . .

extended line has capacities  
from 31 to 32,267 lb

**Uses:** Constant support for hot  
piping in chemical plants or nu-  
clear atomic operations.

**Features:** Redesign and exten-  
sion of line has enabled manufac-  
turer of constant support pipe  
hangers to provide increased sup-  
porting forces and greater travel  
within a given frame size. Load  
capacities from 31 to 32,267 lb  
are available.

**Description:** Nine frame struc-  
tures are available. Redesign allows



Hangers permit expansion and  
contraction of piping systems

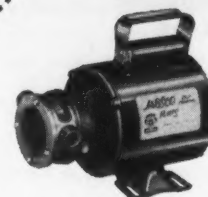
installation closer to other struc-  
tures. Field adjusting bolts have  
been relocated for easy load re-  
adjustment.

(Model R constant support hangers  
are available from Grinnell Co.,  
Inc., Dept. CP, 260 W. Exchange  
St., Providence, R.I. . . or for  
more information check CP 5002  
on form opposite last page.)

Your guide . . . to more  
engineering and mainte-  
nance ideas and equip-  
ment is the alphabetical  
product directory begin-  
ning on page 225 in this  
issue

## cut pumping costs with

# JABSCO INDUSTRIAL PUMPS



Model 4720  
PORTABLE PUMP & MOTOR UNIT  
1/2" Port Size—316 S. S.  
Construction

- ◀ INSTANTLY  
SELF-PRIMING
- ◀ SIMPLE, COMPACT,  
ONLY ONE  
MOVING PART
- ◀ DURABLE NEOPRENE  
IMPELLER
- ◀ SELF-LUBRICATED
- ◀ TROUBLE-FREE  
OPERATION



HERE'S another Jabsco industrial pump—de-  
signed and built for chemical, pharmaceutical  
and other industrial applications. Ideal for transfer  
of various liquids and acids—sump drainage, cool-  
ant pumping, general transfer, pulp in solution,  
filtering, brines, plating solutions—even fluids con-  
taining foreign matter or particles, silt, crystals, and  
other gritty materials. Bronze, stainless steel  
or plastic construction is available to solve  
your specific pumping problems.  
Pumps either light or heavy viscous  
liquids. Temperature ranges from  
35° to 180° F. Write for a Jabsco fac-  
tory recommendation for your own  
needs. Specify application, fluid  
pumped, temperature, pressure, etc.

FREE—  
send for cat-  
alog sheets,  
detailed  
information...  
no obligation,  
of course!

PATENTED  
AND  
PATENTS  
PENDING

## JABSCO PUMP COMPANY

2031 Lincoln Street, Burbank, California

When inquiring check CP 5003 opposite last page

## DARCOVA PUMPCUPS

now available with

## 100% NYLON COMPOSITION

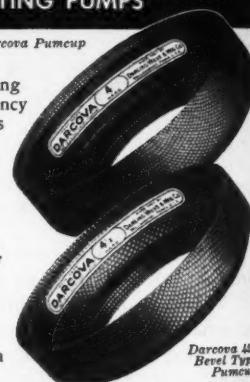
for HYDRAULIC CONTROLS, AIR CYLINDERS,  
RECIPROCATING PUMPS

Darcova Pumcup

DARCOVA PUMPCUPS—long  
noted for unequalled efficiency  
and life in all kinds of cylinders  
—are now greatly exceeding  
their own performance records!  
The new 100% Nylon Composi-  
tion, available only in Darcova  
Pumcups, does it!

Nylon Pumcups are made in  
sizes, types and textures exactly  
right for your particular  
equipment—ready now to give  
you unprecedented piston  
packing performance!

Write for helpful data Bulletin  
No. 5503.



Darcova 4" Bevel Type Pumcup

DARLING VALVE & MANUFACTURING CO.

Williamsport 4, Pa.



TRADE MARK

# Pumcups

When inquiring check CP 5004 opposite last page

CHEMICAL PROCESSING



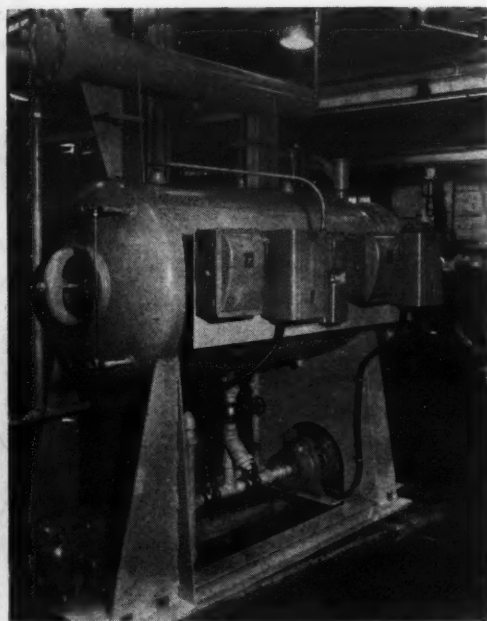
**Reduce steam-generating cost  
with packaged boiler  
return system . . .**

high-pressure condensate used to preheat incoming water for processing

**Uses:** Packaged unit reheats condensate and make-up water for boiler feed.

**Features:** Condensate cooler and receiver, feed-water heater, and all controls, pumps, piping, and accessories are contained in single unit which uses waste heat. Unit reduces atmosphere heat loss found in conventional condensate return systems.

**Description:** Condensate cooler and condensate receiver in package system are of flange-quality steel designed to withstand 125 psig. Receiving tank is

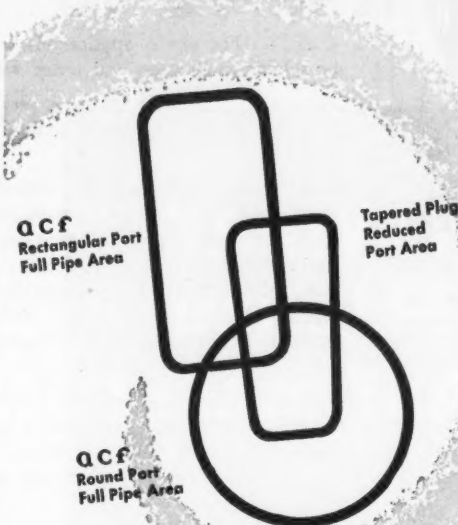


Piping and power connections are all that are required before starting boiler return system

coated to inhibit rust. Horizontal receiver is welded to tank supports and motor mount to form integral structure of heavy flange steel. Controls are mounted on a panel board on side of receiver at a convenient height for easy inspection and operation. Unit comes completely packaged, ready to be set up and piped to steam, condensate, and water lines. Piping and power connections are all that are required before starting operation. Boiler return systems are available in 11 sizes ranging from 30 to 300 boiler hp.

(Packaged boiler return system is a product of The Patterson-Kelley Co., Inc., Dept. CP, 10 Lackawanna Ave., East Stroudsburg, Pa. . . . or for more information about manufacturer's product, reader may simply check CP 5005 on form which is located opposite last page.)

## BEFORE YOU BUY ANOTHER PLUG VALVE...



# COMPARE THE PORT OPENINGS!

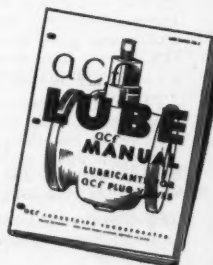
**Turbulence! Loss of head pressure!** These can present real problems when handling slurries and other viscous liquids! And because they are ordinarily the result of valves with "funnel action"... it pays you to make sure that the port opening has the same area as the pipe itself!

Pipe-matching port openings! This is only one of the reasons why more processing engineers than ever before are swinging over to **QCF** Round Port Valves and Rectangular Port Valves. Other features, such as split-second, quarter-turn shut off... specially designed **TEFLON®** GASKET to prevent head leakage... all add up to lower maintenance costs and fewer work stoppages.

**WRITE TODAY** for descriptive Catalog PE-9, **QCF** Industries, Incorporated, Valve Division, 1501 E. Ferry Avenue, Detroit 11, Michigan

**GET YOUR COPY** of the **QCF** Lube Manual, a complete description of lubricants and service recommendations. Ask for Manual No. 3.

\*DuPont Tradename



**QCF Plug Valves are backed up  
by Proof-of-Performance in every  
Processing Industry!**

# QCF



# PLUG VALVES

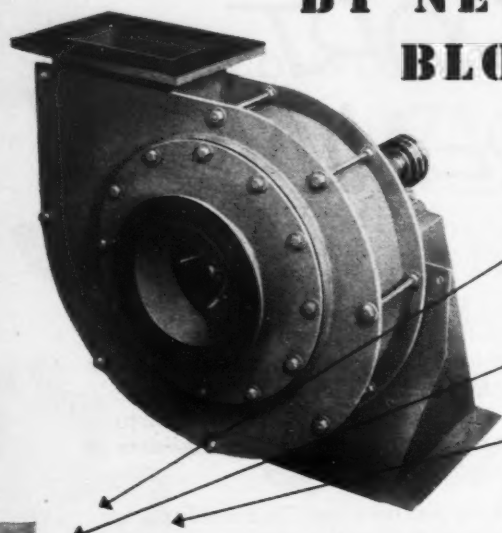
When inquiring check CP 5006 opposite last page



## OUTMODED BY NEW PVC (Type 1) BLOWERS

Designed by

**ipf**



CB 13 3/4  
Arrangement No. 1

If your problem is expelling corrosive fumes and gases, you need IPF Blowers. Ordinary blowers are susceptible to attack by these fumes and gases. Coating the blower is costly — and not foolproof. Maintenance and replacement costs are high . . . and valuable time is lost. Result — an expelling operation that eats into profits.

For trouble-free, long-life blowers, specify IPF blowers made of Unplasticized, Rigid Polyvinyl Chloride (UPPVC). UPPVC — the new construction material — exhibits inherent anti-corrosive qualities that allows IPF Blowers to withstand most chemical fumes and gases from 40°F to 140°F. Actual installations of IPF Blowers have lasted three times the normal life of ordinary blowers . . . and continue to function efficiently.

UPPVC is a lightweight . . . smooth surfaced . . . nonporous material of construction. Lightweight construction means greater capacity per B.H.P. . . . easier installation . . . reduced handling problems. Smooth, nonporous finish never require painting or maintenance expense. IPF Blowers are not subject to unbalance from chipping of a protective coating . . . because there is no coating. It's solid UPPVC.

IPF Blowers made of UPPVC are available in standard sizes that provide displacements from 143 C.F.M. to 7722 C.F.M. Standard wheel sizes of 9 1/2, 13 1/2, 19, and 27 inches. Other sizes and capacities can be custom designed to fit special requirements.

Full details on the new IPF Blowers available upon request.

Full details on the new IPF Blowers available upon request.

MANUFACTURED BY

**industrial plastic fabricators, inc.**

NORWOOD, MASS.

NORWOOD 7-3411

When inquiring check CP 5007 opposite last page

## ENGINEERING & MAINTENANCE

**More wear resistance  
given flexible tube  
by scuffstrip**

**Uses:** For use in applications where tubing will be subject to abrasion and severe wear conditions.

**Features:** Flexible tubing is protected from wear by a thermoplastic scuffstrip secured over the helical flights.

**Description:** Tubing is a flexible, lightweight, reinforced fabric duct designed for carrying air, gases, many solids, and liquids at low pressure. High-carbon spring steel is shaped into continuous helical coils. Multicoated fabric is spirally wound in overlapping plies to form tubular sections. Tubing is available in diameters from 3 through 30".

(Flexible tubing with scuffstrip is available from Flexible Tubing Corporation, Dept. CP, Guilford, Conn. . . . or for more information reader may simply check CP 5008 on the convenient Reader Service slip which is located opposite last page.)

## Offers engineering information on industrial dust control

Practical engineering information on industrial dust control, its installation, operation, and maintenance, is presented in 24 x 36" folder. Information on hood fabrication and system design is included.

Bul 636-3 is available from Aget Manufacturing Co., Dept. CP, 1408 E. Church St., Adrian, Mich. When inquiring reader may simply check CP 5009 on the convenient Reader Service slip which is located opposite last page.



"You've got to convince me these magnets are strong enough to get the tramp iron out of our powder."

# Catawissa

## PERFECT SEAL Unions

**HOT FORGED** from solid, rectangular steel bars, designed and produced for dependable, long-life service under the severest piping conditions!

**A TYPE FOR EVERY USE!  
FOR ALL PRESSURES!  
FOR ALL TEMPERATURES!**



**Standard & Double  
Extra Heavy  
UNIONS**

Available with screwed or socket weld ends. 3000-lb. sizes 1/8" to 3"; 6000-lb. sizes 1/8" to 2".



**ORIFICE  
UNIONS**

With screwed or socket weld ends. 3000-lb. and 6000-lb. service.

**MALE & FEMALE  
UNIONS**



With steel-to-steel, bronze-to-steel, stainless steel-to-steel or orifice seats. 3000-lb. service only.

**FULL STAINLESS &  
FULL ALLOY  
STEEL UNIONS**



With screwed or socket weld ends. 3000-lb. and 8000-lb. service.

**WRITE FOR CATALOG 11  
showing the complete Catawissa  
line of Perfect Seal Products**

**CATAWISSA VALVE AND  
FITTINGS COMPANY**

620 Mill St. • CATAWISSA, PA.

When inquiring check CP 5010  
opposite last page

CHEMICAL PROCESSING

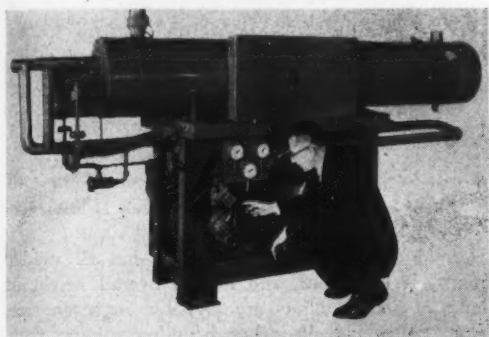


## More cooling capacity per cu ft of chiller size

Aluminum insert doubles heat transfer surface with minimum pressure drop

**Uses:** Chilling of industrial liquids including water, oils, or glycols.

**Features:** Star-shaped aluminum insert imbedded in tube walls by a cold drawing process doubles effective heat transfer surface of liquid chiller. Design adds up to 25% more cooling capacity per cu ft of unit's size. Insert provides clear passages for liquid flow so that pressure drop is minimized.



Packaged liquid chiller is ready for operation after charging with refrigerant

**Description:** Compact packaged units that include compressor, motor, chiller, condenser, heat exchanger, and all necessary controls are available. Units are completely assembled, ready for installation and immediate operation after charging with refrigerant. Series "C" in capacities 20 through 175 tons includes compressor. Series "R", for remote compressor mounting, has capacities 15 through 300 tons.

(Series "C" and "R" packaged liquid chillers are products of Acme Industries, Inc., Dept. CP, 600 N. Mechanic St., Jackson, Mich. . . . or for more information check CP 5011 opposite last page.)

### Variable capacity and head of pump explained

Full page cutaway view is used to illustrate design principles involved in allowing pump to be adjusted to variable capacities and head conditions. Six-page fold-out brochure also lists applications and specifications.

Bul 08B8328 is available from Allis-Chalmers Mfg. Co., Dept. CP, 1151 S. 70th St., Milwaukee 1, Wis. Specify CP 5012 opp. last page.

# PROVED BY PERFORMANCE OF OVER A MILLION TRAPS!

## YARWAY IMPULSE STEAM TRAP

the only  
moving part

... a small stainless steel valve that literally floats on the condensate load. Gets equipment hot in a hurry—and keeps it hot!



Using a theory of thermodynamics never before applied to steam traps, the YARWAY Impulse Trap revolutionized the industry 20 years ago. Today over a million YARWAY traps have successfully proved the Impulse principle.

Advantages like the following continue to win new users, convince old users to standardize:

● QUICK HEAT-UP AND EVEN TEMPERATURES OF EQUIPMENT

- GOOD FOR ALL PRESSURES WITHOUT CHANGE OF VALVE OR SEAT
- SMALL SIZE—LIGHT WEIGHT
- ONLY ONE MOVING PART
- STAINLESS STEEL—minimum maintenance
- WON'T FREEZE UP
- A COMPLETE LINE of sizes and types for every requirement
- IMMEDIATELY AVAILABLE from 270 local Industrial Distributors

For free Trap Selector, or 24 page bulletin, write

YARNALL-WARING COMPANY 125 Mermaid Avenue, Philadelphia 18, Pa.

THERE'S A YARWAY IMPULSE STEAM TRAP FOR EVERY NEED



**SERIES 60  
and 120**  
For all normal trap requirements, pressures to 400 and 600 psi.



**1/2" No. 20-A**  
For light loads on tracer lines, steam mains, small presses, etc.

**SERIES 40**  
For heavy loads requiring extra high capacity steam traps



**INTEGRAL-STRAINER  
HIGH PRESSURE TRAP**  
For high pressures, high temperatures. (Flanged or welding connections.)

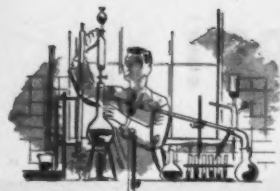


# YARWAY

## IMPULSE® STEAM TRAP

OVER 1,000,000 YARWAY IMPULSE STEAM TRAPS USED

When inquiring check CP 5013 opposite last page

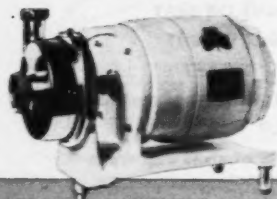


(Right): Tri-Clover stainless steel pumps handle an important liquid conveying job in this pharmaceutical plant.



*Pharmaceuticals  
for Mankind...*

## ...produced with TRI-CLOVER Pumps, Fittings and Valves



One of a complete line of Centrifugal Pumps designed by Tri-Clover. Full details on these modern, efficient units are contained in the complete Tri-Clover Sanitary Pump Catalog 253. Write for your copy.



Both standard acme thread and Tri-Clamp stainless steel fittings and valves are utilized in these liquid process lines.

The scenes depicted here show some of the Tri-Clover pumps and stainless steel fittings and valves now being used by a modern midwest pharmaceutical plant. Tri-Clover supplies the vital elements necessary to provide a "streamlined" processing line with the greatest possible degree of corrosion-resistance and sanitation. This is a typical example of the way Tri-Clover products are used to help solve numerous liquid conveying line and pumping problems for the chemical process industries.

For pumping applications, Tri-Clover supplies corrosion-resistant centrifugal pumps designed to handle, efficiently and economically, any product that will flow to them. For process lines, Tri-Clover fittings and valves are widely used to assure the utmost protection against corrosion and product contamination.

Take advantage of Tri-Clover's exclusive features developed through many years of specialized engineering experience and thorough understanding of liquid conveying problems.

### LADISH CO.

*Tri-Clover Division*  
Kenosha Wisconsin

See your nearest  
Tri-Clover  
Distributor.

TRI-CLOVER

Export Dept.  
8 So. Michigan Ave.  
Chicago, U.S.A.  
Cable TRICLO

1-156

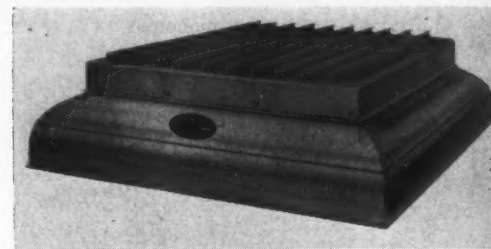
## ENGINEERING & MAINTENANCE

**All-aluminum construction  
makes exhaustor light,  
rust resistant . . .**

installation easily made by only two men  
without special equipment

**Uses:** Exhausting industrial fumes in volumes  
from 3800 to 42,000 cfm.

**Features:** Roof exhaustor is constructed entirely  
of aluminum and is impervious to rust and corrosion.  
Light weight makes installation easy. Two men,  
without special equipment, can easily handle com-  
plete unit.



Roof exhaustor has overall height of only 21 inches

**Description:** All-aluminum unit has all welded  
joints, is leak-proof, and has an overall height of  
only 21 inches. Units are available in seven sizes  
from 20 through 60 inches, handling volumes from  
3800 to 42,000 cfm.

(AlumaLung roof exhaustor is a product of Iron  
Lung Ventilator Co., Dept. CP, 5403 Prospect Ave.,  
Cleveland 3, Ohio. Check CP 5015 opp. last page.)

**Condenser design cuts expense,  
permits shipment of casing  
as flat panels . . .**

evaporative units handle Freon or ammonia,  
are easily accessible for maintenance

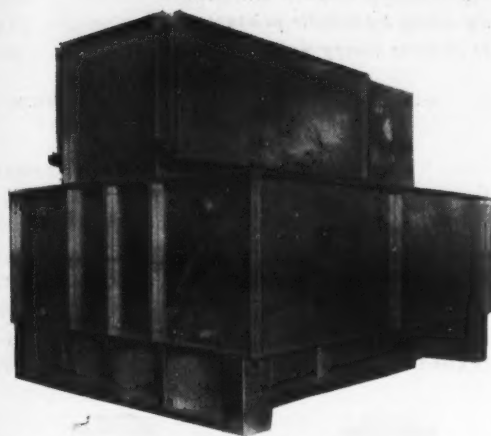
**Uses:** Condensation of refrigerants utilizing  
water evaporation. Units are available in sizes to  
handle from 90 to 240 tons.

**Features:** Panel design of condenser allows casing  
to be shipped as flat panels rather than box-like  
shapes, reducing installation expense. It allows easy  
accessibility to all interior parts for painting, clean-  
ing, or other maintenance necessary. Units will  
handle Freon or ammonia.

**Description:** Refrigerant is condensed in two  
parallel-mounted coils by evaporation of water de-  
livered by sprays arranged over coils. Incoming air,  
which passes over condensing coils, is used to remove  
super-heat from refrigerant in pre-cooling coils and  
excess water from condensing coils, thus improving

When inquiring check CP 5014 opposite last page



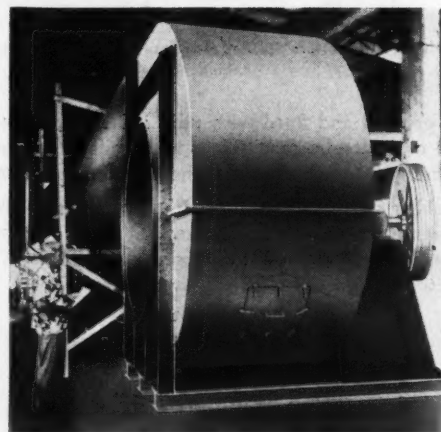


Refrigerant condenser is available in four sizes: 90, 120, 180, and 240 tons

heat transfer from refrigerant gas to air stream.

Only water consumed is that which is evaporated. Excess water is recirculated. Dimensions for largest size unit, rated at 240 tons, are approximately: length 13', width 16', height 10.5'.

(Refrigerant condenser is a product of Niagara Blower Co., Dept. CP, 405 Lexington Ave., New York 17, N.Y. . . . or for more information check CP 5016 on form opposite last page.)



Big wheel—much wind

Centrifugal fan on performance test for static, volume, and unit power consumption. Unit has 73" diameter wheel and will deliver 80,000 cfm at 1 3/4" static pressure. Fan is one of two constructed and weighs 4700 lb. Design is single width, backward blade.

(No. 12 centrifugal fan was manufactured by General Blower Co., Dept. CP, Morton Grove, Ill. . . . or check CP 5017.)

Even hard-to-dry, heat-sensitive chemicals are easy to process

## with **Glascote** conical, rotary DRYER-BLENDERS

These glass-lined vessels assure freedom from contamination . . . flexibility of use . . . shorter drying cycles . . . uniformity of product . . . elimination of handling and sticking losses

**G** LASCOTE conical, rotating Dryer-Blenders give you speed, ease and efficiency for drying and blending a broad range of corrosive and heat-sensitive materials, using either steam or hot water.

As the dryer rotates, it imparts a tumbling action that results in continuous, uniform drying and blending of the material. Non-corrosive, glass-lining assures product purity. Ease of handling and non-sticking properties of the glass-lining reduce product losses.

Glascote Dryer-Blenders are ideally suited for handling heat-sensitive materials. By using hot water in the jacket, very low drying temperatures can be obtained. Continuous exposure of new surface shortens drying cycle and prevents over-drying and caking of material.

Standard glass-lined Dryer-Blenders are built in the following capacities — 5 to 35 cu. ft. and larger on request; operating temperatures — liner 500° F, Jacket 650° F; operating pressures — tank full vacuum to 25 psi, jacket 65-75 psi (50-60 psi with tank at full vacuum). Acid or acid-alkali glass-linings are available. Complete specifications available on request.

Our standard one year guarantee continues to apply to all Glascote glass-lined products.

# Glascote

PRODUCTS, INC.

CLEVELAND 17, OHIO

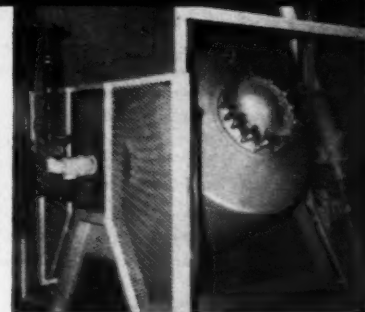
Sales Offices or agents located in

New York • Philadelphia • Union, N. J. • Chicago • Cleveland  
Dayton • Houston • Los Angeles • Toronto • Montreal

Export Sales: A. O. Smith Corp., International Division, Milwaukee 1, Wis.



Installed at the Chicago Heights, Ill., plant of the Victor Chemical Company, this Glascote conical, rotary Dryer-Blender makes possible uniform, short-cycle drying of several materials which couldn't be dried in any other way.



Ask the representative who calls on you for all the facts about Glascote products — reactors, receivers, condensers, columns, storage tanks and accessory products. Or, if you prefer, write direct, Glascote Products, Inc., Cleveland 17, a subsidiary of A. O. Smith Corporation.

A subsidiary of **A.O. Smith Corporation**  
World's largest manufacturer of glass-lined steel products



When inquiring check CP 5018 opposite last page



The "neck" between the pump chamber and motor area of this new Chemumpump acts as a thermal barrier to the transfer of heat from the pumped fluid to the relatively cool fluid circulating in the rotor chamber. Further motor section cooling is achieved by the heat exchanger girdling the stator.

## New Chemumpump handles hot fluids

- No seals . . . no stuffing boxes
- No fluid loss or contamination
- No lubrication . . . 90% less maintenance
- Just one moving part

Now you can pump heat-transfer fluids, hot vegetable and mineral oils, silicone fluids—without leakage . . . without contamination, even under extreme vacuum or pressure! This new Series T Chemumpump ends the problems of transferring or circulating such hot "problem" fluids as Dowtherm, Arochlor, fatty acids, vegetable oils or others.

Pump, motor and heat exchanger are combined in a single, compact hermetic package. Pump impeller and rotor are an integral unit—Chemumpump's only moving part.

Fluid enters the rotor chamber, and is completely isolated from the stator section by a corrosion-resistant, non-magnetic liner. A portion of this fluid is continually re-circulated in the rotor chamber and through an integral heat exchanger by an auxiliary impeller, to cool the motor. Pressure balance at the "neck" prevents intermixing of fluid in the motor section and fluid in the pumping section while the Chemumpump operates at a steady state. Motor windings keep cool, yet there's no heat loss of pumped fluid.

No shaft-sealing device is needed. Normally hard-to-handle fluids—hot, volatile, toxic, corrosive, explosive, radioactive—just can't leak or become contaminated.

Get the facts. For details and application data, send for new Bulletin 1040.

### SPECIFICATIONS

Horsepowers . . .  $\frac{3}{4}$  to  $7\frac{1}{2}$ , in 6 models  
 Heads . . . . . to 190 feet (maximum)  
 Capacity . . . . . to 200 GPM (maximum)  
 Materials of construction\* . . . . . cast iron, cast steel, 300-series stainless steel  
 Temperature limit\* . . . . . 1000°F.  
 Pressure limit\* . . . . . 150 psi

\*Standard. Designs for higher temperatures or pressures, or using other construction materials, available on special order.

# Chemumpump

First in the field . . .  
 process proved

CHEMPUMP CORPORATION • 1300 E. Mermaid Lane • Phila. 18, Pa.

When inquiring check CP 5019 opposite last page

### ENGINEERING & MAINTENANCE

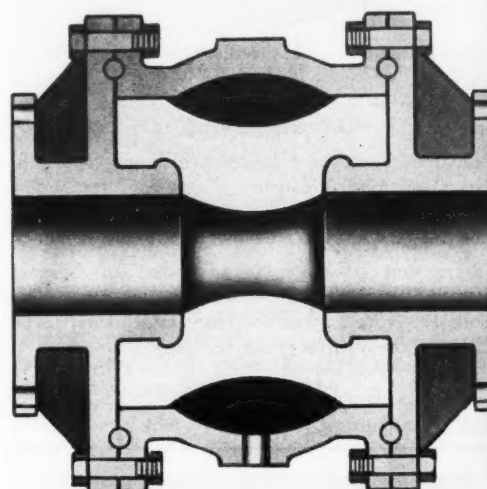
#### Pinch clamp closure eliminated by using hydraulic pressure in rubber slurry valve . . .

castings on valve body permit high pressures, O-rings avoid loss of fluid

**Uses:** Control of flow of abrasive and corrosive slurries.

**Features:** Hydraulic pressure is used to close encased rubber tubing eliminating pinch clamp closures. Method supplies rupture protection, center orifice flow and simple remote finger-tip control.

**Description:** Cylinder grade castings on valve's jacketed body permit high pressure. Body flanges



Hydraulic pressure is used to close encased rubber tubing

are grooved and fitted with rubber O-rings to avoid loss of hydraulic fluid. Units are available in sizes from  $1\frac{1}{2}$ " to 4" with or without hydraulic control.

(Rubber slurry valve is a product of Equipment Engineers Inc., Dept. CP, 41 Sutter St., San Francisco 4, Calif. . . . or for more information check CP 5020 on form opposite last page.)

#### Treats operation, installation of rate-of-flow controllers

Operation and installation of rate-of-flow controllers are discussed in four-page catalog. Engineering drawings detail construction features and tables list principal specifications. Advantages are tabulated.

Bul 600-J9A is issued by Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Dept. CP, 345 Harris Ave., Providence, R.I. When inquiring specify CP 5021 on form opposite last page.



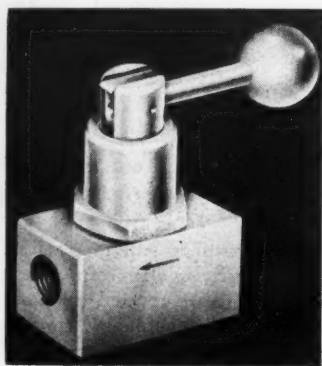
**Quick, positive shut-off  
of liquid or gas with  
toggle action valve . . .**

designed to handle 3000 psi  
without shock or hammer

**Uses:** Hydraulic or pneumatic  
control of shut-off of liquid or gas  
flow.

**Features:** Quick-acting toggle  
lever operation gives immediate  
dead tight shut-off. Valve is de-  
signed for liquid or gas for any  
pressure up to 3000 psi.

**Description:** Valve stem crosses  
a throttling seat which assures  
gradual starting or stopping of  
flow, eliminating shock or water



Toggle-operated valve can be  
used in hydraulic or pneumatic  
service

hammer in system. Perfect sealing  
is achieved by use of a resilient  
O-ring, protected from fluid stream  
by floating sleeve arrangement.  
Units can be used in either hy-  
draulic or pneumatic service and  
operate smoothly and easily up to  
full rated capacity.

(Toggle-operated valve is a prod-  
uct of James-Pond-Clark, Dept.  
CP, 2181 E. Foothill Blvd., Pasa-  
dena 8, Calif. . . . or for more in-  
formation reader may simply check  
CP 5022 on convenient Reader  
Service slip opposite last page.)

For more information on prod-  
uct at right, specify CP 5023  
... see information request  
blank opposite last page.



# King Size (but at no extra cost)

## MIDWEST

### "LONG TANGENT" ELBOWS

Among all standard welding elbows, only  
Midwest "Long Tangent" Elbows can be  
described as "King Size" . . . only they have  
the long straight ends which equal  $\frac{1}{4}$  of the  
nominal fitting diameter (a 12" Midwest  
"Long Tangent" Elbow has tangents 3" long).  
This greater length is responsible for signifi-  
cant savings on many piping systems (see  
advantages listed below). For additional  
information, ask your Midwest distributor or  
write us for Catalog 54.

#### MIDWEST PIPING COMPANY, INC.

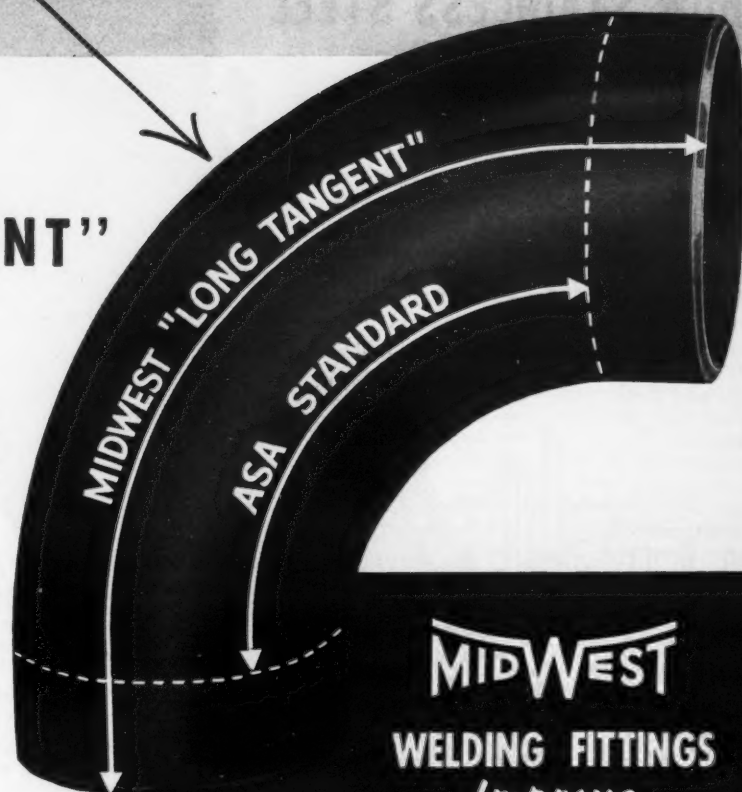
Main Office: 1450 South Second Street, St. Louis 4, Mo.

Plants: St. Louis, Clifton, N. J. and Los Angeles

#### Sales Offices:

New York 7—50 Church St. • Chicago 3—79 West  
Monroe St. • Cleveland 14—616 St. Clair Ave. • Los  
Angeles 33—520 Anderson St. • Houston 2—1213  
Capitol Ave. • Tulsa 3—224 Wright Bldg. • Miami 34  
—2103 Le Jeune Rd. • Boston 27—426 First St.

STOCKING DISTRIBUTORS IN PRINCIPAL CITIES

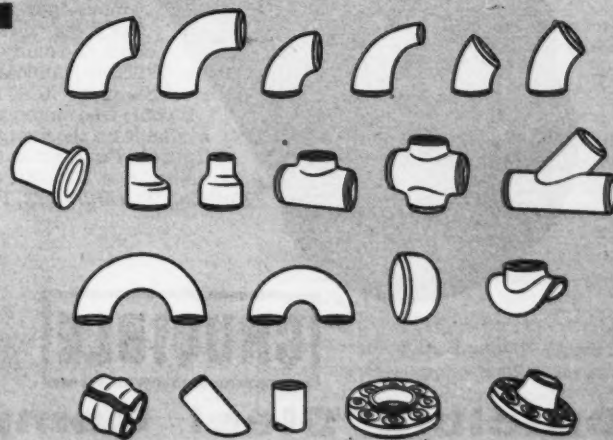


**MIDWEST**  
**WELDING FITTINGS**  
*Improve*

**PIPING DESIGN and REDUCE COSTS**

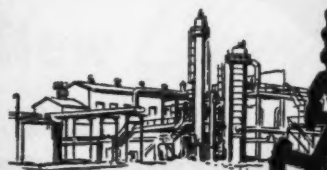
### ADVANTAGES OF MIDWEST "LONG TANGENT" ELBOWS

- ★ They save pipe.
- ★ They often eliminate short nipples and their extra welds.
- ★ They save time and money in lining up and clamping pipe and fitting.
- ★ They make it easier to apply slip-on flanges.
- ★ They remove the circumferential weld from point of maximum stress and can be sleeved.
- ★ THEY COST NO MORE THAN OTHER ELBOWS.



**MIDWEST HAS THE MOST COMPLETE LINE**

## HOW STAINLESS STEEL brings a whole set of advantages to critical processing jobs



This 60-inch diameter nitric acid absorber tower typifies the application of stainless steel in the chemical processing industry. Made by the Vulcan Manufacturing Division of Cincinnati, Ohio, it is an excellent example of how several properties of a specific type of stainless steel team up to solve a tough chemical processing problem.

The stainless that Vulcan chose for the all-welded body is Crucible Rezistal® Type 347. Here are three big reasons why:

**High tensile strength** to minimize structural support.

**Stability** against formation of harmful carbides, both during welding and in high-temperature operation.

**Remarkable corrosion-resistance** to withstand lasting exposure to nitric acid. It is fully resistant to the acid in diluted form at any temperature, and to concentrated solutions at lower temperatures. It is satisfactorily resistant to concentrated solutions above the boiling point.

Your operations may not call for nitric acid absorber towers, but if they include any critical phase of chemical processing, check the many advantages offered by the 30 available types of Crucible stainless steel. You'll find details in "Making the Most of Stainless Steels in the Chemical Processing Industry," which is yours free on request. And, to find out what information is available on the many other Crucible special steels, ask for "Crucible Publication Catalog." Or consult your nearby Crucible representative. *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 22, Pa.*

# CRUCIBLE

first name in special purpose steels

## Crucible Steel Company of America

When inquiring check CP 5024 opposite last page

## new literature

### High quality chemical products pictured in brochure

Glycol ethers, ethers of hydroquinone, sodium bisulfate, sulfur dioxide, methyl chloride, and niacin are technically described in 20-page brochure. A custom service for methylated products using  $\text{CH}_3\text{Cl}$  as methylating agent, and for synthetic pyridine derivatives is also mentioned. Some very fine photographs accompany the text.

"Ansul Chemical Products" is issued by Chemical Products Dept., Ansul Chemical Co., Dept. CP, Marinette, Wis. When inquiring specify CP 5025 on form opposite last page.

### Presents facts and figures on construction subjects

Aggregate specifications, crusher settings, feeder capacities, electrical data, screens, tank capacities, and standard gages of wire are covered in 100-page handbook. Glossary of eight pages covers terms of the highway, heavy-construction, and other basic industries.

"Facts and Figures 11th Edition" is available from Pioneer Engineering Works, Inc., Dept. CP, 1515 Central Ave., Minneapolis 13, Minn. When inquiring check CP 5026 on form which is located opposite last page.

### Suggests rapid technique for sulfur content

Four-page bulletin in two colors discusses technique for rapid determination of sulfur content in liquid hydrocarbons. Method measures absorption of K-capture X-radiation emitted by radioactive Iron-55. Method described is applicable to determining sulfur concentrations ranging from about 0.05 to 2.7%. Carbon-hydrogen ratio of material being measured must be known within  $\frac{1}{2}$  unit for sulfur contents around 0.1% and to within 1 unit for sulfur contents around 1.0%.

Bul P-104 is issued by Tracerlab, Inc., Dept. CP, 130 High Street, Boston 10, Mass. When inquiring specify CP 5027 opposite last page.



Industrial bulletins pertinent to the reader . . . offering data on products, processes, service

#### Compilation of ASTM standards on soaps, other detergents

Compilation containing specifications, methods of test, and definitions of terms for soaps and other detergents is presented in 176-page, 6 x 9", paper-bound booklet. Revised addition contains 42 specifications and tests, six of which are new and 12 revised.

To obtain "ASTM Standards on Soaps and Other Detergents (with related information)" remit \$2.50 direct to American Society for Testing Materials, Dept. CP, 1916 Race St., Philadelphia 3, Pa.

#### Data on non-metallics for pump impellers

Report on recent findings with respect to physical and chemical characteristics of non-metallic impellers for displacement pumps is set forth in four-page folder. Synthetic elastomers, fluorocarbons, and resinous laminates are surveyed.

"Non-Metallics for Impeller Pump Use" is issued by Eco Engineering Co., Dept. CP, 12 New York Ave., Newark 1, N.J. When inquiring specify CP 5028 on form opposite last page.

#### Organic chlorine compounds, applications listed

Applications of 18 organic chlorine compounds, their solvent properties, and proper handling and storage are discussed in well illustrated 48-page booklet. Special section gives selected references for various fields of application in addition to references given for individual compounds. Fields covered include fumigants, solvents and extractants, vapor degreasing, dewaxing, dry cleaning, and intermediates.

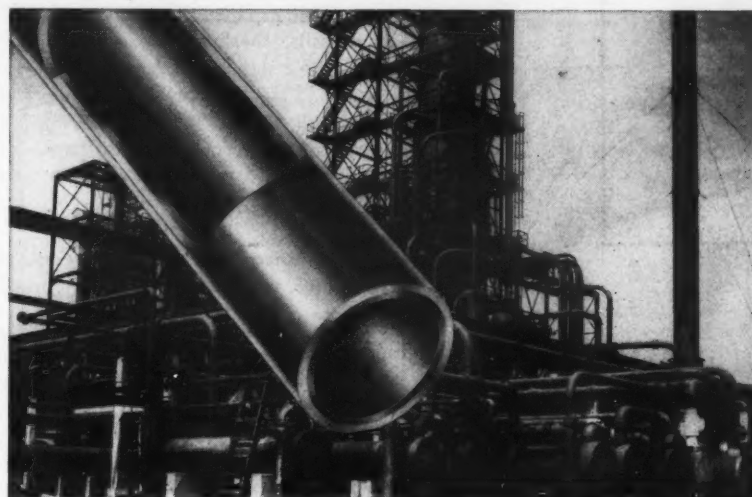
Bul F-4769 is issued by Carbide and Carbon Chemicals Company, a Div. of Union Carbide and Carbon Corp., 30 East 42nd St., New York 17, N.Y. When inquiring specify CP 5029 on form opposite last page.

## BRIDGEPORT BRASS COMPANY CONDENSER AND HEAT EXCHANGER TUBE EDITION

# COPPER ALLOY BULLETIN

BRIDGEPORT  
CO.

MILLS IN BRIDGEPORT, CONN. AND INDIANAPOLIS, IND.—IN CANADA: NORANDA COPPER AND BRASS LIMITED, MONTREAL



## The Inside and Outside Story of Duplex Tube

In cases where a different type of corrosion attacks each side of a heat exchanger tube, many users of heat exchanger tubes have found that tubes made of a single metal often are not a solution to both corrosion problems. This is the reason why Bridgeport Duplex Tubes were developed—because a one-metal tube had not proved itself the universal answer to dual corrosion.

Bridgeport Duplex Tubes are supplied in more than 100 combinations of ferrous and nonferrous metals. Their economy has been clearly proved. If your heat exchanger tubes are failing to give you all the service life you think you should get, it is very likely that Duplex Tube—which takes advantage of the best qualities of both metals—can save you money. Our specialists will be glad to study your problems, and assist in selecting a combination of tube that best fits your needs.

Installation of Duplex Tube is not suggested as the solution to every tube problem. But where dual corrosion conditions exist, Duplex Tubes can save money. Before we recommend Duplex Tube, each alloy is carefully selected to withstand the specific corrosion problem on each side of the tube. Pitting

or cracking—faults frequently found in certain types of one-metal Tubes—is often eliminated by Duplex Tubes. By gauging the thickness of inside and outside tube walls to the rate of corrosion, longer and uniform tube operating life are assured.

Heat transfer properties of Duplex

#### RESULTS OF HEAT TRANSFER TESTS DUPLEX VS. SINGLE WALL TUBE

Steam Condensed on Outside Surface With Fresh Water Passing Through The Tubes

Water Velocity Feet per Second	OVERALL HEAT TRANSFER RATE AT INDICATED WATER VELOCITY BTU/HR./SQ. FT./° F.	
	Duplex Tube 3/4" O.D. x Wall Thicknesses .0325" and .0325"	Regular Tube 3/4" O.D. x Wall Thicknesses .065"
2 1/2 3 1/2	Steel to Steel 371 458	Steel 380 458
	Copper to Copper 580 750	Copper 600 740
2 1/2 3 1/2	Steel to Copper 465 625	Steel 380 458

are often actually better than those of single-wall Tube. This is a result of Bridgeport's method of manufacture which insures a good, tight mechanical bond between the two alloys. The table illustrates why smaller or more efficient heat exchangers are possible with Duplex Tube.

Heat exchanger tubes that do not give full service life cannot give their operators their money's worth. The service that tubes will give should be balanced by the costs of maintenance, retubing and, of course, the original cost of the tubes. Here, as an example, is the experience of one oil refiner. His first heat exchanger tubes of Low Carbon Steel had lasted only 4 to 5 weeks, and each retubing job cost him more than the tube itself. He then replaced the Low Carbon Steel with another more highly resistant tube, and operating life increased to 3 months. Still not satisfied that he was getting maximum service life for his investment he installed Duplex Tube, stainless steel to the product side and a copper alloy to the cooling side. That was two years ago, and his Duplex Tubes are still giving excellent service.

For chemical plants producing colorless formaldehyde, we have supplied Duplex Tubes with Admiralty on one side for brackish water, and aluminum on the outside. For oil refining and natural gas refining, we have made Duplex Tube with steel outside to resist various corrosive vapors, gases and oils; and copper or copper-base alloys inside toward fresh or salt water.

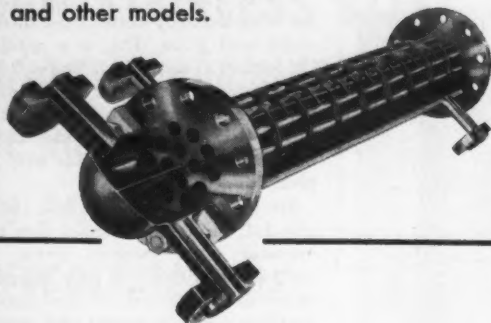
Such experiences with Duplex Tubes have been successful for many years in oil refining, production of synthetic rubber, process industries, chemical plants, coke by-product plants, ammonia production and ammonia refrigeration systems, and other applications. Duplex Tubes have proved repeatedly to be the least expensive equipment over long periods of time because of longer service life and a reduction in frequency of retubing and shut-down periods.

Write today for your copy of Bridgeport Technical Bulletin #1954, describing properties, applications, installation methods and other important Duplex Tube information. (660)

When inquiring check CP 5030 opposite last page

## Heat Exchangers . . . new low prices

Use of standard stockable components slashes cost of fixed tube sheet designs and other models.



Never before have these standard corrosion-resistant units been offered at such low current prices. Here's what you get—

**Specifications—Standard Heat Exchangers** (all sizes to 30" nominal shell diameter)

**Design Pressure:** 75 psi shell side; 75 psi tube side.

**Design Temperature:** 350°F

**Gaskets:** Pfaudler Type CBS (Compressed asbestos with special Buna S binder. Suitable for acids and solvents except powerful oxidizers such as  $\text{HNO}_3$ , hot concentrated  $\text{H}_2\text{SO}_4$ , chlorosulfonic acid, chromic acid, brominations, and  $\text{H}_2\text{O}_2$ .)

**Shell and Baffles:** Carbon steel or Stainless, type 304 or 316 S.S.

**Tubes:** Stainless steel, Type 316 or Type 304,  $\frac{1}{4}$ " O.D., 18 gauge, welded.

**Tube Sheets:** Stainless steel, Type 316 or Type 304.

**Bonnets:** Stainless steel, Type 316 or Type 304 or Carbon Steel.

**Code:** Built to ASME Code U-69, and TEMA Class A Specifications.

Write or call your Pfaudler representative for fast delivery, complete specifications and prices on these heat exchangers—plus help in custom engineering a unit to meet any exceptional problems you may have. Or send coupon for Manual No. 837.



### THE PFAUDLER CO.

Dept. CP-G-4, Rochester 3, N. Y.

Send Manual 837, giving application data and specifications on stainless heat exchangers.

Name \_\_\_\_\_  
Company \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

When inquiring check CP 5031 opposite last page

## NEW LITERATURE

### Includes quick couplings for gases and liquids

Supplement to general catalog of laboratory supplies features quick couplings for air, hydraulic, or fluid handling applications. Catalog supplement consists of approximately 100 pages and describes laboratory clamps, micro glassware, humidity cabinets, electric ovens, polyethylene lab utensils, thermometers, and hydrometers.

Supplement No. 1 is issued by Ace Glass, Inc., Dept. CP, Vineland, N. J. When inquiring specify CP 5032 on form opposite last page.

### Shows single pan balance weighing to 200 gm

Including descriptive material on a single pan balance with capacity of 200 grams, 16-page booklet describes latest additions to list of laboratory equipment. Items featured include pipettes, relative humidity apparatus, freeze drying equipment, high vacuum pump.

"What's New", No. 25 is issued by Scientific Glass Apparatus Co., Inc., Dept. CP, 100 Lakewood Terrace, Bloomfield, N. J. When inquiring specify CP 5033 on form opposite last page.

### Features solvents available for chromatography

Besides listing 43 solvents useful for chromatography, 134-page catalog also lists over 700 laboratory instruments, supplies. Items listed include all those stocked by company since publication of its last general catalog. All items include specifications, illustrations, and prices.

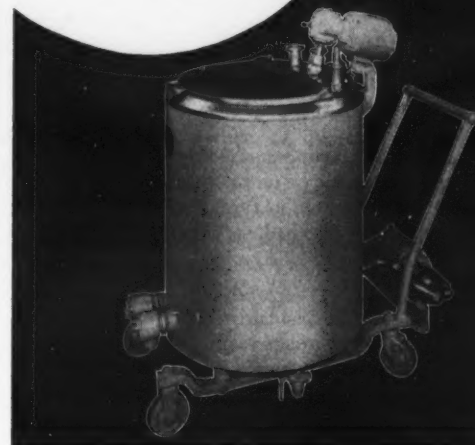
Cat Supplement A-6 is issued by Will Corporation, Dept. CP, Wilco Drive, Rochester 3, N. Y. Specify CP 5034 opposite last page.

### Synthetic organic chemicals, physical properties

Latest data on more than 350 organic chemicals are presented in 24-page technical brochure. Products are arranged by related groups with data on applications and physical properties given in tabular form. An alphabetical index is included.

Bul F-6-136 is available from Carbide and Carbon Chemicals Co., Div. of Union Carbide and Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. When inquiring specify CP 5035 on form opposite last page.

## take your tank with You



### FOR FAST HEATING, THOROUGH MIXING

Mix your product in this portable Cherry-Burrell Rollaway Univat and heat with either steam or electricity . . . pull it to any desired point in your processing system for unloading . . . and you can count on improved product quality and flavor.

Long-sweep propeller agitator provides gentle, positive agitation for fast heating . . . thorough mixing and blending of ingredients. Water jacketing assures uniform heating action over entire tank lining, whether steam or electricity is used.

Sanitation? It's built-in; linings and covers are non-corrosive, easy-to-clean stainless steel.

Portable as well as stationary Univat mixers with adjustable leg heights are made in 50 and 100 gallon sizes. For complete details see your Cherry-Burrell Representative OR CLIP COUPON.



427 W. Randolph Street, Chicago 6, Ill.  
Dairy • Food • Farm • Beverage • Brewing • Chemical • Equipment and Supplies  
SALES AND SERVICE IN 58 CITIES—U.S. AND CANADA

Cherry-Burrell Corporation  
Dept. 150, 427 W. Randolph St.,  
Chicago 6, Illinois

Send details on Univat Mixers.

Name .....  
Company Name .....  
Address .....  
City ..... Zone ..... State .....

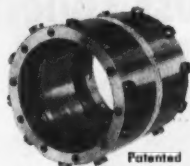
When inquiring check CP 5036 opposite last page

CHEMICAL PROCESSING



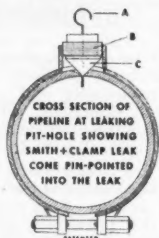
## Safer...Quicker Pipeline Repairs

**WELD + ENDS** Permits  
Welding a Pipeline  
While Pumping Through It



A pipeline safety welding coupling for crude oil, gas, gasoline, asphalt, steam, chemical process and other pipelines. WELD + ENDS joins pipe securely so flow can be resumed immediately at full pressure. Welding can be performed while pipeline is in use days or weeks later. Sizes 2" to 36".

**Smith + Clamp** Permits  
Plugging and Welding  
Pit-Hole Leaks in a Pipeline  
While Pumping Through It



Smith + Clamp shuts off more easily, quickly and safely than ordinary clamps. Use on high and low pressure gas, gasoline, crude oil, water, steam, air, chemical process and other pipelines. Sizes 1" to 30". Combine with WELDPLATE when pipe reinforcement is specified.

Write today for complete information on these latest developments in safer, quicker pipeline repairs: Weld + Ends and Smith + Clamp. Address Dept. A1

### THE PIPE LINE DEVELOPMENT CO.

3700 DETROIT AVE., CLEVELAND 2, OHIO

When inquiring check CP 5037  
opposite last page

APRIL 1956

## NEW LITERATURE

**Shows non-destructive testing  
using gamma rays**

Explaining application of gamma ray equipment, four-page bulletin in two colors illustrates methods for non-destructive testing. Spot, hemispheric, and panoramic radiographs are explained. Information is given as to how projectors are positioned for different applications.

Bul P-196 is issued by Metal & Thermit Corp., Dept. CP, 100 E. 42nd St., New York 17, N.Y. When inquiring specify CP 5038 on form opposite last page.

**Illustrates redesign  
for buckets, chain**

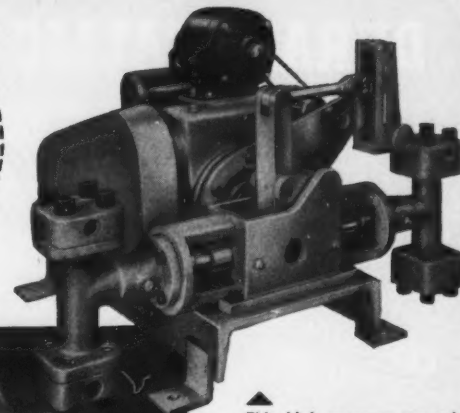
Catalog shows redesigned chains and sprocket wheels for bucket elevators. Illustrations point out heavier wearing surfaces to allow for link wear in service. Specifications and engineering drawings are included for both sizes.

Cat DC-855 is issued by Beaumont Birch Co., Dept. CP, 1505 Race St., Philadelphia 2, Pa. When inquiring specify CP 5039 on form opposite last page.

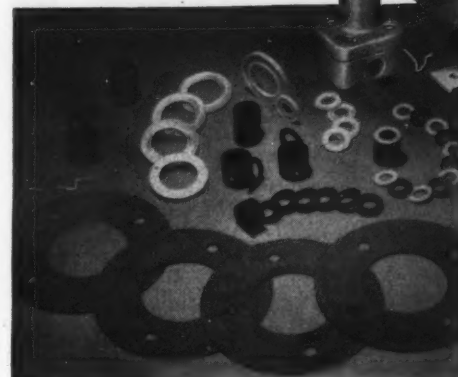


"Hey, Joe... I just discovered the craziest stuff!"

And if you "discover" some real crazy cartoon stuff, CHEMICAL PROCESSING would like to see it. Sam Mattleman, who works for Atlantic Refining in Philadelphia, thought the above cartoon up and sent it to us. He got \$10 for it. You can profit too. See details on page 23.



▲ This high pressure pump is one of a complete line of Philadelphia pumps designed in capacities from 2cc to 15,000 gph.



◀ Garlock Teflon packings, CHEVRON packings, and Garlock gaskets such as these assure uninterrupted service of Philadelphia pumps.

**"GARLOCK has the answer  
for ALL our packing and gasketing problems"**

Since its early years, the Philadelphia Pump and Machinery Company, has standardized on Garlock packings and gaskets for its 863 different models of controlled capacity pumps for pressures up to 50,000 psi. The reasons are simple:

- 1 Only Garlock makes a *complete* line, therefore only Garlock can take complete responsibility for all packing and gasketing problems on all Philadelphia pumps.
- 2 Garlock's engineering service is unduplicated in the industry. (Every one of Garlock's 125 salesmen is a trained packing expert.) In addition, Garlock maintains an Engineering Service Department staffed with specialists in every phase of packing and gasketing.

Prove for yourself that Garlock has the answer for every packing and gasketing problem. Call your local Garlock representative.

### THE GARLOCK PACKING COMPANY, PALMYRA, N. Y.

Sales Offices and Warehouses: Baltimore, Birmingham, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Houston, Los Angeles, New Orleans, New York City, Palmyra (N.Y.), Philadelphia, Pittsburgh, Portland (Ore.), Salt Lake City, San Francisco, St. Louis, Seattle, Spokane, Tulsa

In Canada: The Garlock Packing Company of Canada Ltd., Toronto, Ont.



# GARLOCK

**PACKINGS, GASKETS, OIL SEALS,  
MECHANICAL SEALS, RUBBER EXPANSION JOINTS**

When inquiring check CP 5040 opposite last page

## DURAMETALLIC Packings

*Throughout  
your plant*

... wherever you have stuffing boxes to be repacked, specify Durametallic "Engineered For The Job" products for longer packing life and satisfactory sealing service.

Write today for our packing File No. DMCP

**DURAMETALLIC CORP.**  
KALAMAZOO, MICHIGAN

VALVES  
CENTRIFUGAL  
PUMPS

COMPRESSORS

RECIPROCATING  
PUMPS

When inquiring check CP 5041 opposite last page

Prevent Excessive Wear  
to Vessel Liners by Ar-  
moring them with ...

## KLEMP HEXTEEL and FLOORSTEEL

Hexsteel and Floorsteel are carbon or stain-  
less steel armors and retainers for castable  
refractory monolithic linings. They prolong  
the life of an installation by retarding  
abrasive and corrosive action! Our engi-  
neering department is prepared to design  
your total lining requirements. Speedy  
delivery guaranteed!

Write  
for your FREE  
copy of "Serving  
the Oil Industry  
for Over  
40 Years."



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6601 South Melvina Avenue  
Chicago 38, Illinois

**KLEMP METAL GRATING CORPORATION CP**  
6601 South Melvina Avenue, Chicago 38, Ill.

Gentlemen:  
Kindly send me literature describing Hexsteel and  
Floorsteel applications in the petroleum and  
chemical industries.

Name \_\_\_\_\_  
Firm \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_  
Phone \_\_\_\_\_

When inquiring check CP 5042 opposite last page

## NEW LITERATURE

### Data on safe handling of metallic sodium

Summary of sodium handling know-how on plant scale is incorporated in revised 42-page booklet on general sodium handling techniques. Specific answers are given to some common problems. Sections include data on sodium and its uses, sodium handling equipment, handling techniques, general safety and first aid measures.

"Handling Metallic Sodium On A Plant Scale" is issued by U.S. Industrial Chemicals Co., Division of National Distillers Corporation, Dept. CP, 99 Park Ave., New York 16, N.Y. When inquiring specify CP 5043 on form opposite last page.

### Overcoming absenteeism subject of folder

Printed in full color, attractive pocket-size cartoon booklet is packed with suggestions and tips on overcoming absenteeism.

"Fit As A Fiddle" is issued by National Safety Council, Dept. CP, 425 N. Michigan Ave., Chicago 11, Ill. When inquiring specify CP 5044 on form opposite last page.

### Explains electrical method to measure motion

Discussing how linear variable differential transformers allow electrical measurement of small mechanical displacements, six page folder suggests possible applications. System is adaptable to measurement of force, pressure, weight, stress, flow, other quantities which can be considered in terms of small displacements. Folder includes short discussion of operating principles.

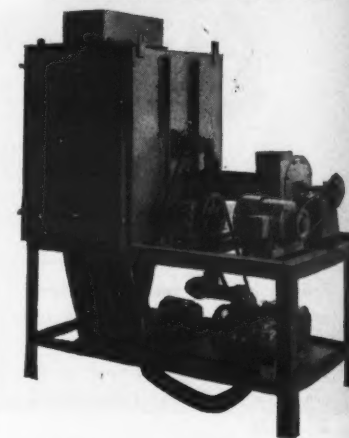
LVDT Control Systems is issued by Daytronic Corporation, Dept. CP, 216 S. Main St., Dayton 2, Ohio. When inquiring specify CP 5045 on form opposite last page.

### Shows plastic use in clothing

Illustrated 12-page catalog section shows industrial gloves, raincoats, protective work suits, aprons, and other accessories employing Koroseal plastic.

Cat 12,000 is issued by B. F. Goodrich Co., Dept. CP, Akron, Ohio. When inquiring specify CP 5046 on form opposite last page.

## NEW! KOPPERS Model D Aeroturn Dust Collector



*fits anywhere and  
maintains over 99.9%  
efficiency  
automatically!*

Easy to install—completely factory assembled, delivered to you ready to uncrate and put into operation. Compact, yet exclusive automatic efficiency (over 99.9%) still maintained.

The "heart" of this new Koppers Model D Aeroturn is the reverse-air-jet action. This reverse air cleans the filter bag, maintains ideal filtering conditions automatically. Pressure switch controls cleaning action by switching air jet arm "on" when pressure rises—"off" when pressure is normal for highest efficiency.

Get more information about this exclusive dust collector. From 500 to 4800 CFM capacities! Write today for complete engineering data explaining operation, floor space, maintenance and installation features! KOPPERS COMPANY, Inc., Industrial Gas Cleaning Dept., 5304 Scott St., Baltimore 3, Maryland.



\* Hersey Patents

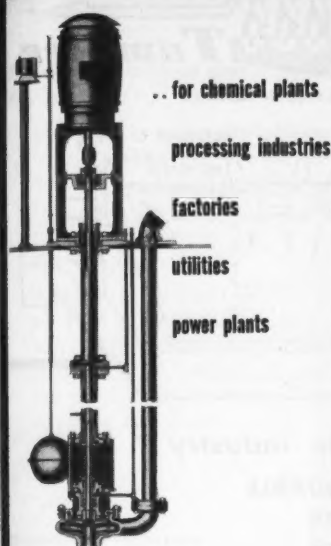
**AEROTURN  
DUST COLLECTOR**

Engineered Products  
Sold with Service

When inquiring check CP 5047  
opposite last page

CHEMICAL PROCESSING





## the YEOMANS heavy duty vertical wet pit pump

.. ideal for corrosive drainage .. grit, ash, abrasives .. acids and alkalis .. molten nonmetals

Here's why Yeomans Heavy Duty Vertical Wet Pit Pumps are better for you!

- No priming necessary. Pump primes itself .. stays primed.
- Saves space .. requires only enough area for small cover.
- Easy to service. Just break pipe and electrical connections .. then lift out pump assembly.
- Exclusive Lubri-Vac® lubrication system reduces main bearing failures 90-95% .. increases pump life 10 to 12 times.

Ask for your copy of Catalog 3007 which gives additional information.

# YEOMANS

2003-S N. Ruby Street, Melrose Park, Ill.

.. manufacturers of: centrifugal pumps • pneumatic sewage ejectors • distributors • clarifiers • mechanical aerators • digesters.

When inquiring check CP 5048 opposite last page

### Emergency first aid chart for quick reference

Condensed instructions for treatment of laboratory emergencies are contained on wall chart for fast reference. Revised edition (1956) has A-to-Z listing of treatments for specific poisons as well as treatment for particular accidents and corrosive chemical burns. Back pressure-arm lift method of artificial respiration is illustrated. Chart is 18 x 27" with metal edges at top and bottom. Metal eyelet allows hanging on wall.

"Laboratory Emergency Chart" is available on letterhead request to Fisher Scientific Company, Dept. CP, 303 Fisher Building, Pittsburgh 19, Penn.

### Names colloidal dispersions for industrial applications

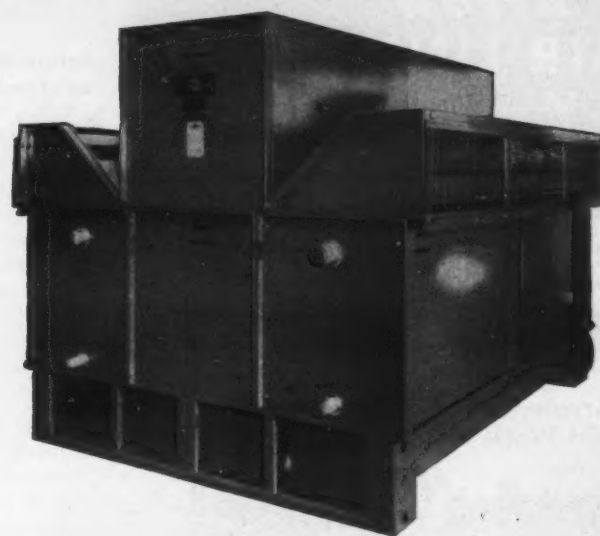
Colloidal and semi-colloidal dispersions for operational functions, maintenance, lubrication, machine design, and other industrial applications are covered in four-page revised booklet. Among the 42 items listed are dispersions of graphite, molybdenum disulfide, mica, zinc oxide, and acetylene black. Carriers and diluents are given for each product, along with typical applications and important physical data.

"A List of 'dag' Dispersions for Industry" is available from Acheson Colloids Company, Div. of Acheson Industries, Inc., Dept. CP, 2150 Washington Ave., Port Huron, Mich. When inquiring specify CP 5049 on form which is located opposite last page.

### Lists 11 ways to save drafting time

Eleven specific ways to save drafting time are explained in 16-page booklet. Methods involve use of intermediates to make modifications of drawings without changing the original. Clearly illustrated, topics covered include: Scissor editing, masking, the block-out method, successive additions, and pre-printing. Other methods shown are transparent matte tape, pick-off transfer, composite grouping and overlays, non-reproducible blue, and use of corrector fluids.

Booklet "11 Ways to Save Drafting Time" is issued by Reader Service Division, Frederick Post Company, Dept. CP, 3666 N. Avondale Avenue, Chicago 18, Illinois. When inquiring specify CP 5050 on form which is located opposite last page.



## NIAGARA SECTIONAL Aero HEAT EXCHANGER

gives close temperature control,  
saves you **LABOR**, Power, Water

- Because the new design improves the heat transfer to the out-door air by evaporation.
- Because new features keep your equipment working for long life with "new plant" efficiency...always full capacity.
- Because you save 95% of cooling water cost.

You get faster, more accurate cooling of industrial fluids to specified temperatures.

You improve your quality of production by removing heat at the rate of input.

You save labor in upkeep. With full access to all interior parts and piping you see everything in easy inspections. You head off dirt accumulation and corrosion. Casing panels are removable without moving the coils. The coils can be cleaned from both sides.

First cost is low; freight is low because of the lowest space/weight ratio; you save much labor in erection. Capacity range is 7,000,000 to 18,000,000 Btu/hr. No other heat exchange method gives you so much saving in money and convenience.

Write for Niagara Bulletin 132. Ask for the full story of how you can save expense in your plant and improve your product's quality.

## NIAGARA BLOWER COMPANY

Dept. CP, 405 Lexington Avenue  
NEW YORK 17, N. Y.

District Engineers in Principal Cities



Over 40 Years' Service in Industrial Air Engineering

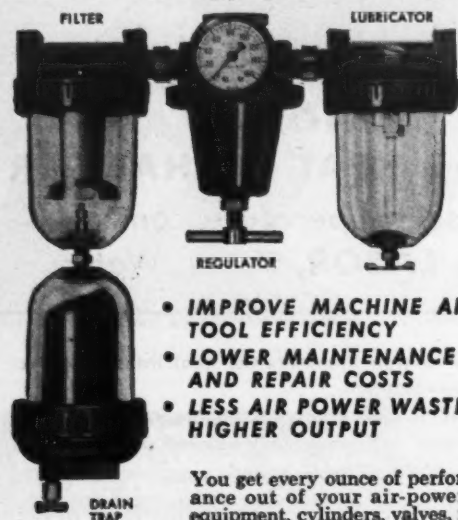
When inquiring check CP 5051 opposite last page

## Arrow AIR LINE FILTER PROTECTS PRODUCTION LIFE LINES

PARTICLE  
STOPPAGE  
26-51 MICRONS

98% FREE  
MOISTURE  
REMOVAL

**Arrow Autopneumatic Controls  
Prevent Work Stoppage—Save Repairs**



- IMPROVE MACHINE AND TOOL EFFICIENCY
- LOWER MAINTENANCE AND REPAIR COSTS
- LESS AIR POWER WASTE—HIGHER OUTPUT

You get every ounce of performance out of your air-powered equipment, cylinders, valves, impact wrenches, tools, etc. with the **ARROW AUTOPNEUMATIC CONTROL ASSEMBLY**. The compressed air is properly cleaned. The Regulator Valve controls pressure without waste of air and the **ARROW Lubricator** supplies the correct amount of fine oil mist in the air stream to properly lubricate appliances or tools in operation. The Automatic Trap discharges accumulated sludge to give perfectly conditioned and controlled compressed air for uninterrupted production schedules.

Tool down-time, operator lost time, parts replacements and expensive repairs are practically eliminated.

### All the Facts Are Yours for the Asking

Let **ARROW** field consultants point the way to better production economy at no cost to you. **ARROW** will be happy to send you their engineering catalog and make recommendations.

Your inquiries invited.

**ARROW TOOLS, INC.**  
1904 S. KOSTNER AVE. • CHICAGO 23, ILL.

When inquiring check CP 5052 opposite last page

## NEW LITERATURE

### Safety data on chemicals

Individual data sheets provide authoritative information for individual industrial chemicals presenting health hazards through toxicity, acute or chronic irritation. Current sheets deal with aniline, benzene, formaldehyde, amyl acetate, acetaldehyde, sulfur dioxide, hydrogen sulfide, n-butanol, cadmium, carbon tet. Subsequent guides are planned.

Each guide includes, as minimum information, allowable concentrations for short and long term exposures, significant chemical and physical properties, major uses, evaluation of exposures, engineering control procedures, medical control procedures, and references to the literature.

Hygienic Guide Sheets may be obtained by remitting 25 cents each direct to American Industrial Hygiene Assn., Dept. CP, 14125 Prevost, Detroit 27, Mich.

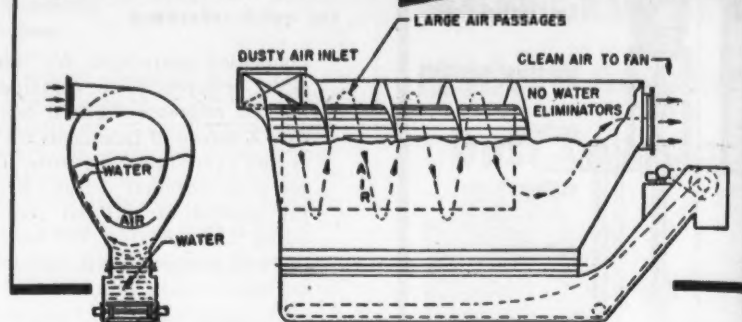
### Condensed reference file for plastics, resins

Technical data on over fifty special and general-purpose phenolic, vinyl, styrene, polyethylene, fluorothene, polyester, silicone, and epoxy plastics and resins are presented in 12-page booklet. Specific properties and information on forming and processing in manufacturing operations are included. Typical products and uses are shown in 65 photographs.

Subjects included are: molding materials, laminating plastics, protective coating resins, flexible film and sheeting, and plastic rigid sheets.

"1956 Condensed Reference File" is available from Bakelite Company, a Div. of Union Carbide and Carbon Corp., Dept. CP, 300 Madison Ave., New York 17, N.Y. When inquiring specify CP 5053 on form which is located opposite last page.

## THIS IS THE . . . **Air Tumbler**



**the master of DUST in industry \* \* \***

**SIMPLE—DEPENDABLE  
NO FIRE HAZARD  
HIGH EFFICIENCY  
CONSTANT CAPACITY  
LOW OPERATING COST**

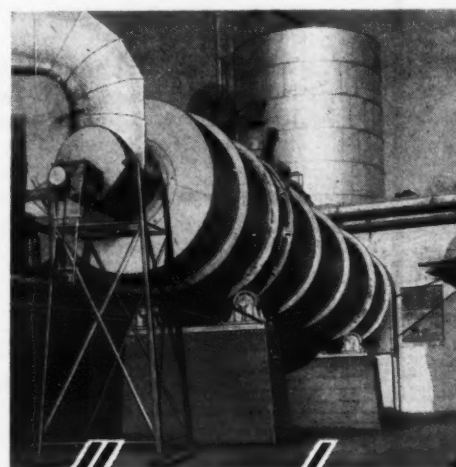
Write for Bulletin No. 551. Address:

**DUST SUPPRESSION & ENGINEERING COMPANY**

P. O. BOX 67, LAKE ORION, MICHIGAN

Agents in all principal U. S. cities

When inquiring check CP 5054 opposite last page



**Honeymead uses DAVENPORT  
ROTARY AIR COOLER**

10'-0" diameter x 50'-0" long. Davenport Rotary Air Cooler operating on soy bean meal at the Mankato, Minnesota Plant.

If you have a de-watering or cooling problem, let us send you our complete, illustrated catalog.

For quick reference, see your 1954 or 1955 Chemical Engineering Catalog. C

**davenport MACHINE and  
DAVENPORT, IOWA  
U.S.A. FOUNDRY COMPANY**

When inquiring check CP 5055 opposite last page

CHEMICAL PROCESSING



**Includes sampling gun for metals**

Including a short description of a sampling gun for metals, 20-page booklet also describes laboratory equipment for paper electrophoresis and chromatography.

Announcer #55-11-60 is issued by Burrell Corp., Dept. CP, 2223 Fifth Ave., Pittsburgh 19, Pa. When inquiring specify CP 5056 on form opposite last page.

**Butadiene-styrene rubber latices**

Eight butadiene-styrene rubber latices are described in 8-page booklet. Uses, descriptions for both the "hot" and "cold" latices are given.

"Synthetic Latex" is issued by Latex and Lotol Dept., Naugatuck Chemical Div., U.S. Rubber Co., Dept. CP, Naugatuck, Conn. When inquiring specify CP 5057 on form opposite last page.

**Covers construction, use of strainers**

Details of construction for company's line of strainers and air eliminators are well illustrated in eight-page brochure. Cutaway views, line drawings, photographs are used to show design features and applications. Complete dimensions and specifications are included.

Bul OG-326 is issued by Rockwell Manufacturing Co., Dept. CP, 400 N. Lexington Ave., Pittsburgh 8, Pa. When inquiring specify CP 5058 on form opposite last page.

For more information on product at right, specify CP 5060 ... see information request blank opposite last page. ➔

# Change motors in minutes—

## with FALK all-steel MOTOREDUCTORS



OUT COMES OLD MOTOR ➔



IN GOES REPLACEMENT MOTOR ➔

### No long and costly "down time" involved

Motors can be interchanged or replaced in minutes with the all-steel, All-Motor type FALK Motoreducer. No long and costly "down time" is involved in making the change!

Best of all, replacement is not limited to original make of motor—new NEMA frames may be substituted for old. This versatile Motoreducer operates with any make, speed or type of standard foot-mounted motor within its AGMA rating. No modification, no special shaft, no "partial" motor required.

In addition to unmatched motor interchangeability, this dependable gear drive—the "work horse of industry"—offers: widest choice of output-shaft position (horizontal, vertical, right-angle)...any output-shaft connection...any mounting, including wall and ceiling...standard speed range from 1.5 rpm to 1430 rpm. All these advantages, plus proved efficiency, low maintenance and extra-long life, make the All-Motor type FALK Motoreducer your best buy for any job requirement.

Furnished in sizes up to 75 hp with any make, style or type of motor; or, without a motor if desired. FALK Motoreducers are available from convenient factory, field or distributor stocks, from coast to coast.

Write for Bulletin 3100

THE FALK CORPORATION, MILWAUKEE, WISCONSIN

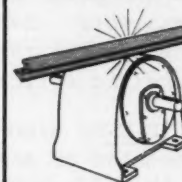
MANUFACTURERS OF:

- Motoreducers
- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
- High Speed Drives
- Special Gear Drives
- Single Helical Gears
- Herringbone Gears
- Marine Drives
- Steel Castings
- Weldments
- Contract Machining

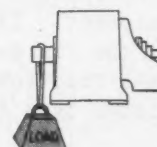
# FALK

...a good name in industry

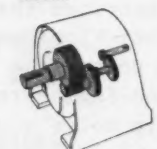
### FALK "IN-BUILT" FACTORS assure full dependability—better service—longer life



**ALL-STEEL HOUSINGS**  
Rugged, strong, rigid ...all parts heavy steel plate, formed and welded in the Falk Weld Shop.



**LARGE OVERHUNG LOAD CAPACITY**  
Large shafts, oversize bearings...rigid mountings with wide bearing spans to handle maximum loads.



**PRECISION GEARING**  
Heat-treated alloy steel gearing, precision cut and shaved after heat treatment to eliminate distortion.



**SEALED HOUSINGS**  
Splashproof, dustproof, oiltight. Dual closures and one-way vents keep oil in, dust and moisture out.

## Pumping Progress Report FOR CHEMICAL ENGINEERS

An advertisement prepared by the Aldrich Pump Co.,  
Member of Hydraulic Institute, U.S.A.

**UREA PRODUCTION**, like many other chemical processes, presents difficult pumping problems. Urea slurry is both corrosive and erosive. Either condition can cause serious operational headaches; together they spell trouble for both design and maintenance engineers.

**PUMPING UREA SLURRY** was the problem given to Aldrich by a foremost urea producer. Our solution was effective. We recommended ...

**A 6" STROKE DIRECT FLOW TRIPLEX** with several modifications — porcelain plungers instead of hardened alloy steel — a Hastelloy B Fluid End. Direct Flow construction insured minimum cost replacements in the event of unavoidable corrosion damage.

**ALDRICH DIRECT FLOW DESIGN** offers many advantages to pump users. Two right angle turns are eliminated — the liquid being pumped travels directly, on a horizontal plane, from the suction to the discharge manifold. Reduced space between valves results in higher volumetric efficiency.

**SECTIONALIZED FLUID-ENDS** also afford greater economies of maintenance. Valves can be removed without special equipment. Individual sections of the fluid-end can be replaced at a fraction of the cost of conventional type fluid-ends.

**DATA SHEET 67A** describes the Aldrich 6" Stroke Direct Flow Pump Series, ranging in power from 300 to 900 hp. Aldrich Engineers are available to help solve your tough pumping problems. Write: The Aldrich Pump Company, 23 Gordon Street, Allentown, Pa.

When inquiring check CP 5061 opposite last page

## NEW LITERATURE

### Three bulletins describe dust collectors

Variety of dust collecting equipment which offers solution to a wide range of problems is covered in three bulletins. Bul 105 describes dust filters with self-adjusting blow rings manufactured under Hersey patents. This unit works continuously with no shutdown for filter cleaning.

Bul 304 describes a similar type of dust filter designed for use where only a minimum of space is available. Bul 970 explains the features of a recently introduced mechanical collector for installations most suitable for this type of equipment.

Buls 105, 304, and 970 are issued by Metal Products Div., Koppers Co., Inc., Dept. CP, 200 Scott St., Baltimore 3, Md. When inquiring specify CP 5062 on form which is located opposite last page.

### Tumbling-finishing equipment reviewed in catalog

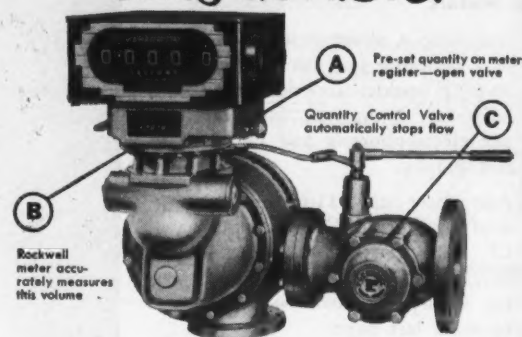
Full line of tumbling-finishing equipment and allied products is reviewed in 13-page brochure. Catalog is complete with drawings and photographs, and lists specifications, capacities, and prices.

Tumbling-finishing equipment catalog is issued by Rampe Manufacturing Co., Dept. CP, 14915 Woodworth Ave., Cleveland 10, Ohio. When inquiring specify CP 5063 on form opposite last page.



"Now this little model's for small fires ... like your cigar, there. . ."

## Automatic Quantity Control Easy as A.B.C.



### Pre-set Liquid Meter Shut-off ... Without Shock

This simple, rugged Rockwell system makes automation available to the process industries. It's the answer to many a costly problem in batching, blending or handling piped liquids. With electrical controls you can "set it and forget it" on repetitive operations. Available in stainless steel, bronze, steel or all-iron construction. Get facts now from Rockwell Manufacturing Company, Pittsburgh 8, Pennsylvania. Dept. 106 D

## ROCKWELL Industrial METERS

When inquiring check CP 5064 opposite last page

## sure cure FOR destructive water hammer

### Josam SHOCK ABSORBERS

The pounding, shaking noise you hear in your pipe lines is "Water Hammer" — as destructive as it is noisy — loosening fittings, damaging valves and appliances, and causing expensive repairs! JOSAM SHOCK ABSORBERS easily, inexpensively and permanently "cure" hammering and vibration in pipe lines. Send coupon today for latest scientific data.

**JOSAM MANUFACTURING CO.**  
Dept. CP • Michigan City, Indiana

Please send free copy of Manual "S" on WATER HAMMER

Firm \_\_\_\_\_  
By \_\_\_\_\_ Title \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

When inquiring check CP 5065 opposite last page

CHEMICAL PROCESSING



### Barometric condensers — how and where

System of operation for two types of barometric condensers is described and pictured in eight-page bulletin. Various typical installations are illustrated.

Form 9012-A is available from Ingersoll-Rand Co., Dept. CP, 11 Broadway, New York 4, N.Y. When inquiring specify CP 5066 on form opposite last page.

### Pneumatic "muscles" for industry covered in data sheet packet

Packet of specification sheets describes performance and construction specifications of pneumatic power positioners, pneumatic "muscles" for industry. Data sheets cover positioner cylinder sizes ranging from 4 x 5" to 12 x 48". Applications of positioners to control of flow, pressure, temperature, or level by operating valves, gates, or dampers are outlined.

Bul TP-MFI is issued by Hagan Corp., Dept. CP, 323 Fourth Ave., Pittsburgh, Pa. When inquiring specify CP 5067 on form opposite last page.

### Products derived from tin, antimony, and zirconium discussed

Chemicals and other products derived from tin, antimony, and zirconium are described in six-page, two-color bulletin. Formulas, description, and uses for various product groups including organotin stabilizers, stannous soaps, and various metals and alloys are given. Recently-introduced tin derivatives are grouped separately.

Bul C197R is issued by Metal & Thermit Corp., Dept. CP, 100 E. 42nd St., New York 17, N.Y. When inquiring specify CP 5068 on form opposite last page.

### Sifters assure sanitary, dustless operations

Full line of floor-mounted sifters having high capacity and requiring small floor space are discussed in four-page bulletin. Units are designed to meet rigid sanitary standards and are capable of producing from two to twelve separations. Bulletin includes technical data and specifications.

Bul 135-A is issued by Sprout-Waldron & Co., Inc., Dept. CP, Muncy, Pa. When inquiring specify CP 5069 on form opposite last page.

WALWORTH

# Cast Steel Gate Valves

Series 150 and 300

Wedge Gate — Outside Screw and Yoke



Sectional view of Series 300

**Big 8-Point Superiority!**

**Gland clearances** are such that stem cannot be scored if gland should be tightened unevenly.

**Deep Stuffing Boxes** in all sizes (2" to 24") insure tightness and maximum packing life — costly leaks are eliminated.

**Bonnets and Bodies** are engineered to withstand pressure and minimize distortion — they're tough, durable, dependable.

**Heavy Steel Walls** provide extra strength and longer life.

**Integral Body Guide Rib Faces** are machined to insure accurate disc seating.

**Seat Rings** are bottom seated — not flange type. No recess exists at back of ring — hence no turbulence, erosion, or pressure drop.

**Streamlined Ports** allow high velocity, non-turbulent flow, and reduce the possibility of erosion.

**Valves** regularly have flanged ends. They can be supplied with ends for butt welding. Roller bearing yokes are available. On valves 5 inches and larger, by-passes can be furnished.

*For Series 600 and higher, we recommend Walworth Pressure-Seal Steel Gate Valves.*

For further information on Walworth Cast Steel Gate Valves, see your local Walworth distributor, or write:

# WALWORTH

Manufacturers since 1842

**valves • fittings • pipe wrenches**

60 EAST 42nd STREET, NEW YORK 17, N. Y.

**DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD**

When inquiring check CP 5070 opposite last page

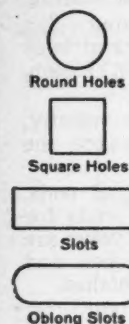
# CHECKLIST

for  
**EFFICIENT  
SCREENING  
OPERATION**

- |  | Yes                      | No                       |
|--|--------------------------|--------------------------|
| Is the screen you use tear-proof and warp-proof?         | <input type="checkbox"/> | <input type="checkbox"/> |
| Does your screen last as long as you expect it to?       | <input type="checkbox"/> | <input type="checkbox"/> |
| Is it easily replaced with a minimum of down time?       | <input type="checkbox"/> | <input type="checkbox"/> |
| Are the openings in the screen the exact size you want?  | <input type="checkbox"/> | <input type="checkbox"/> |
| Are the openings of uniform size, shape and spacing?     | <input type="checkbox"/> | <input type="checkbox"/> |
| Is the temper of the metal proper for your requirements? | <input type="checkbox"/> | <input type="checkbox"/> |
| Do you have a minimum of blinding in the screens?        | <input type="checkbox"/> | <input type="checkbox"/> |
| Are they easy to keep clean?                             | <input type="checkbox"/> | <input type="checkbox"/> |

If you can't answer "yes" to every question, you are losing efficiency and should try

## H&K Perforated Metal Screen



Precision made perforated screens, for your particular requirements. Quickly made to your order.

Round holes up to 6". Oblongs, squares and slots of various dimensions. Thickness up to 1".

Fill in and mail coupon to office and warehouse nearest you.

## Harrington & King PERFORATING CO.

Chicago Office and Warehouse 5636 Fillmore Street Chicago 44, Ill. New York Office and Warehouse 110 Liberty Street New York, N. Y.

Please send me—

- ☐ GENERAL CATALOG NO. 62  
☐ STOCK LIST of Perforated Steel Sheets  
☐ SAMPLES of Perforated Plastics and Paper  
☐ PRICE INFORMATION (NOTE: Send specifications of perforated materials wanted. If necessary send drawings or sketches.)

NAME \_\_\_\_\_  
 TITLE \_\_\_\_\_  
 COMPANY \_\_\_\_\_  
 STREET \_\_\_\_\_  
 CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

When inquiring check CP 5071 opposite last page

## NEW LITERATURE

### Thermal properties of gases listed in tables

Tables covering thermodynamic and transport properties of air, argon, carbon dioxide, carbon monoxide, hydrogen, nitrogen, oxygen and steam, are listed in 478-page book. Thermodynamic properties are tabulated for the real gas at pressures up to 100 atmospheres and to temperatures of 600°K for hydrogen, 1500°K for carbon dioxide, 850°K for steam, and 3000°K for the remainder. Ideal-gas thermodynamic functions are tabulated uniformly to 5000°K. Also tabulated are vapor pressures, thermal conductivity, viscosity, and Prandtl number.

To obtain NBS Circular 564, "Tables of Thermal Properties of Gases", remit \$3.75 direct to Government Printing Office, Washington 25, D. C.

### Two folders tell applications of PVC pipe

Two folders in a total of ten pages describe applications, sizes, properties, and give other information on pipe and fittings made from polyvinyl chloride. Two types of the corrosion-resistant material are covered. The recently-introduced pressure-rated rigid PVC pipe which offers the same working pressure in every size from 1/2 to 4" is also explained. Table shows pipe's resistance by field tests to a wide range of frequently encountered chemicals. Installation procedures are also described.

Two folders on PVC pipe are issued by Alpha Plastics Inc., Dept. CP, 14 Northfield Rd., West Orange, N.J. When inquiring specify CP 5072 on the convenient Reader Service slip which is located opposite last page.

### Chart shows film thickness from % solids in coating

Six-page, fold-out specifications chart describes characteristics, surface preparation, and method of application for company's epoxy coatings. Feature of folder is two charts showing relationship of film thickness to % solids by volume and the effect of thinner addition on % solids by volume. Specific properties of coatings are included.

Specification P-18 is issued by Truscon Laboratories, Division of Devco & Reynolds Company, Inc., Dept. CP, Caniff & Grand Trunk Railroad, Detroit 11, Michigan. When inquiring about manufacturer's product, reader may simply check CP 5073 on the convenient Reader Service slip which is located opposite last page.

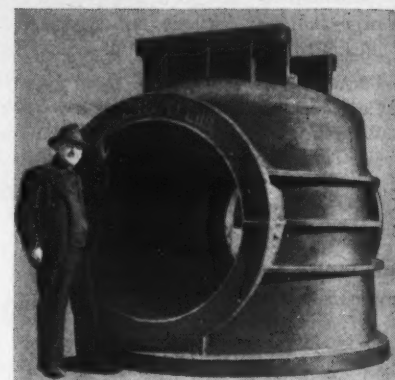
# KUTZTOWN Skill

## CREATES AROTOVALVE CASTING

This 54" arotvalve for the New York City Board of Water Supply, was cast of High Tensile Iron. The job had to meet ASTM specification A-278-44T Class 50 iron calling for a minimum tensile strength of 50,000 psi in 2" sections.

In 2" diameter test bars on a 24" span, this nickel-chromium-molybdenum cast iron developed a minimum transverse strength of 10,300 pounds. Technical knowledge of metallurgy plus a working knowledge of loam molding spelled success.

Whatever your requirements in castings may be, we are certain that you will find Kutztown services more than adequate. Engineering knowledge, precise molding techniques and inquisitive inspection are the forces that join together to make castings by Kutztown products of high quality workmanship.

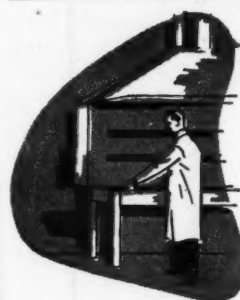


We'll be happy to place your name on our mailing list to receive regular issues of the "Kutztown REVIEW".

- GRAY IRON
- PRESSURE IRON
- HIGH TENSILE IRON
- NI-RESIST
- LO-ALLOY IRON
- DUCTILE IRON

**KUTZTOWN FOUNDRY & MACHINE CORP.**  
KUTZTOWN, PENNSYLVANIA

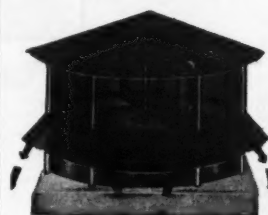
When inquiring check CP 5074 opposite last page



## Safely Ventilate MOISTURE and FUMES

Three outstanding features make Air-Van (R) Power Exhausters especially suited to situations where moisture and fumes are present.

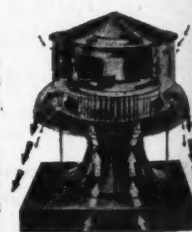
- The motor is out of the air stream.
- A positive air seal-off creates a constant curtain of fresh clean air around the motor shaft. This absolutely prevents fumes from entering the motor housing.



5,000-65,000 CFM.  
S.P. to 4".

Patents  
2188741—2526290  
Patents pending

Patented scroll effect design assures positive air removal. Research has shown that without scroll effect, efficiency beyond 1/4" S.P. is impossible.



Direct Drive  
150-11,000 CFM.  
S.P. to 4.2"

Other Gallaher features include low silhouette, weather-proof design, low noise levels, and availability in special metals and finishes.

**The GALLAHER Company**  
Pioneers in Research-Designed Power Roof Exhaustors  
4108 Dodge St. Omaha, Nebraska

When inquiring check CP 5075 opposite last page

CHEMICAL PROCESSING



**Helpful suggestions on use of rubber linings**

Twelve-page catalog describes rubber linings for tanks, pipes, valves, and similar storage and process equipment. Linings covered resist corrosion and abrasion and prevent product contamination. Catalog contains helpful suggestions for effecting economies in the bulk handling of chemicals and a complete guide for the proper selection of rubber linings.

Catalog 7115 is issued by Manhattan Rubber Div., Raybestos-Manhattan, Inc., Dept. CP, Passaic, N.J. When inquiring specify CP 5076 on form opposite last page.

**Physical and dimensional data of finned tubing listed**

Design advantages of serrated, helically-wrapped finned tubing are highlighted in four-page folder. Tables cover most commonly used sizes of tubing. Materials of construction are included.

Cat C-3008 is issued by Drayer-Hanson, Inc., Sub. of National-U.S. Radiator Corp., Dept. CP, 3301 Medford St., Los Angeles 63, Calif. When inquiring specify CP 5077 opposite last page.

**Gives engineering data on air cylinders**

Complete engineering drawings and specs on heavy-duty air cylinders for automatic machinery are in 12-page catalog. Information includes piston area, cylinder thrust force, and air requirements.

"Heavy-Duty Air Cylinder" is issued by Petch Manufacturing Co., Dept. CP, 463 York, Detroit 2, Mich. When inquiring check CP 5078 on form opposite last page.

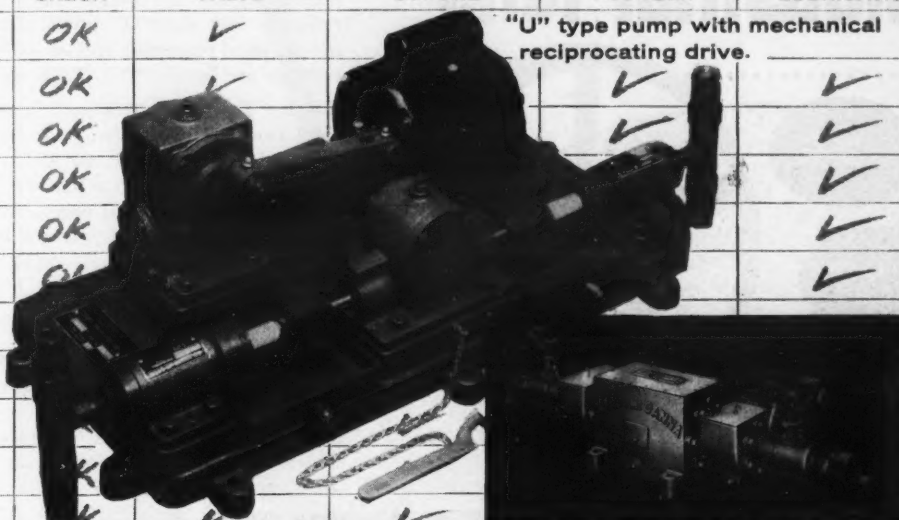
**Lists everything needed for chromatography**

Booklet of 20 pages in two colors has comprehensive listing of equipment needed for chromatographic and electrophoresis work. Listing includes fraction collectors, migration chambers, densitometers, spectrophotometers. Solvents and adsorbents are also listed. Prices are included.

Harshaw Chromatography Catalog is issued by Harshaw Scientific Div., Harshaw Chemical Co., Dept. CP, 1945 E. 97th St., Cleveland 6, Ohio. When inquiring specify CP 5079 on form opposite last page.

## Why the FIRST COST is the LAST COST with HILLS-McCANNA METERING PUMPS

PUMP MAINTENANCE REPORT					
MONTH	CHECK	VALVE	STROKE	PLUNGER	LUBRICATION
JANUARY	OK	✓			
FEBRUARY	OK	✓		✓	✓
MARCH	OK	✓		✓	✓
APRIL	OK	✓		✓	✓
MAY	OK	✓		✓	✓
JUNE	OK	✓		✓	✓
JULY					
AUGUST					
SEPTEMBER					
OCTOBER	OK	✓	✓		
NOVEMBER	OK	✓	✓		
DECEMBER	OK	✓	✓	✓	



"U" type pump with mechanical reciprocating drive.

"K" type pump with hydraulic drive.

### HILLS-McCANNa dependability pays off in lower maintenance ... longer life ... greater accuracy ... cost-saving versatility

Maintenance reports from the leaders in many different industries prove the low-cost operation of Hills-McCanna metering and proportioning pumps... tell why these pumps are specified for installations requiring the finest equipment. Part replacement is remarkably low because there are few points of wear. Routine maintenance is simple and economical thanks to special Hills-McCanna features, such as separate interchangeable check valves and easy, precise stroke adjustment (even while in operation when desired). Working parts are completely enclosed to keep them dirt-free. All U Type pump bodies are interchangeable in the housing for quick convertibility. Straight reciprocal drive eliminates bushing replacement. And,

you'll find Hills-McCanna pumps mighty easy to install.

If you must continuously meter or proportion small volume flows with great accuracy, you'll want to consider the "U" type pump—available in 1, 2, 3 and 4 feed units. The "K" type pump—also available in 1, 2, 3 or 4 feed units—will meet your larger flow requirements.

Hills-McCanna can furnish a pump to meet every type of installation... with a wide choice of corrosion, wear and abrasion-resistant liquid ends... in capacities and pressures for every need.

Write for full facts now. You'll be dollars ahead tomorrow by investigating today!

A dependable NEW HEART to put NEW LIFE into your chemical metering system!

## HILLS-McCANNa COMPANY

3025 N. Western Avenue, Chicago 18, Illinois

also manufacturers of: metering and proportioning pumps  
FORCE FEED LUBRICATORS • DIAPHRAGM VALVES  
MAGNESIUM ALLOY SAND CASTINGS

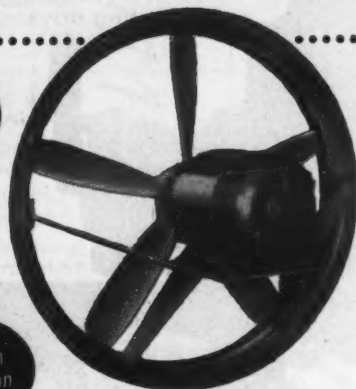
When inquiring check CP 5080 opposite last page

# Most versatile of all industrial fans

1020 to  
85000 CFM

12" to 60"  
sizes

Mounts in  
any position



## PROPELLAIR TYPE "CD" DIRECT CONNECTED FAN

Use this heavy-duty fan for ventilation... to exhaust heat, dust, moisture, fumes and smoke. It's powerful, dependable, efficient. Use it in ductwork, hoods, roof ventilators, wall mountings or for air circulation and cooling. Engineered to move a lot of air at low cost.

### You get these important features:

- Cast aluminum airfoil propeller for greater efficiency
- Dependable R & M All-Weather Motor direct connected for long, trouble-free service
- Venturi entrance ring with tip seal to create efficient air flow
- Rugged steel motor support arms welded to entrance ring
- Explosion-proof and glass-insulated motors available
- Fan and motor covered by a single Robbins & Myers guarantee



Write for Bulletin 690-C



Man Cooler Sky-Blast Vaneaxial Tubeaxial Extended Shaft

When inquiring check CP 5081 opposite last page

## NEW LITERATURE

### Covers bonding adhesive for rubber-to-metal

Applications of rubber-to-metal bonding adhesive in vulcanization bonding of butyl compounds to brass plate and primed metals is covered in two-page data sheet. Composition, physical properties, and advantages are listed.

Bul on "Thixon IB-2" is available from Harwick Standard Chemical Co., Dept. CP, 60 S. Seiberling St., Akron 5, Ohio. Specify CP 5082 opp. last page.

### Stearates, their uses and properties

Comprehensive 36-page booklet outlines properties and uses of metallic stearates. Items included are: uses of metallic soaps, typical analysis of metallic stearates, analytical procedures and government specs, and special soaps.

Applications mentioned are: ceramics, explosives, lacquers, oils, paints, paper, pharmaceuticals, plastics, petroleum, rubber, varnishes, waterproofing, and waxes. Booklet contains two-page index for easy reference and useful shipping information.

Bul 55-2 is available on letterhead request to Witco Chemical Co., Dept. CP, 122 E. 42nd St., New York 17, N.Y.

### Using plastic materials for packaging

Printed in three colors, eight-page illustrated guide shows dozens of packages and packaging ideas using plastic materials. Techniques and recommendations are discussed.

"1956 Guide to Improved Packaging" is issued by Bakelite Co., Div. of Union Carbide & Carbon Corp., Dept. CP, 300 Madison Ave., New York 17, N.Y. Specify CP 5083 opp. last page.

## Big Stocks of Glass Materials in 9 NEFF & FRY Bins



Barytes, cullet, feldspar, limestone, salt cake, silica sand, slag, soda ash—these are the materials handled and stored in Neff & Fry Bins at Foster-Forbes Glass Co., Marion, Ind. Four of the nine bins are shown in the photograph.

It would take this entire space to list all of the flowable bulk materials for which our bins are used. In many cases, considerable ingenuity is required to meet the loading and unloading situations. That's when our engineering knowledge plays an important part.

Chances are you'd select our bins for your bulk materials if you knew all the reasons. Ask for our folder, "Bins With the Strength of Pillars."

Not exported except to  
Canada and Mexico

THE NEFF & FRY CO. • 166 Elm St. • Camden, Ohio

NEFF & FRY SUPER-CONCRETE STAVE  
STORAGE BINS

When inquiring check CP 5084 opposite last page

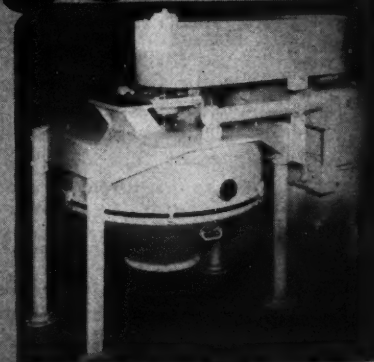
## PARTICLE SIZE REDUCTION!

High Productivity Rates per  
HP expended ...

Narrow Particle Size Range...

Minimum Product Heating ...

Capacity...up to 10,000 pounds  
per hour or higher on friable  
materials.



Belt Drive "ENTOLETER" Impact Mill  
equipped with 25 HP motor.

We shall be glad to process samples of  
your product on the "ENTOLETER"  
Impact Mill in our laboratory.

The trademark "ENTO-  
LETER" is your guarantee  
of complete satisfaction.

ENTOLETER DIVISION  
The Safety Car Heating and Lighting Company, Inc.

1183 Dixwell Ave.—New Haven 4, Conn.

When inquiring check CP 5085 opposite last page

CHEMICAL PROCESSING

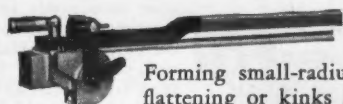


# Quickly Bend

tubing  
pipe  
conduit



... with a Greenlee Hand Bender



Forming small-radius bends without flattening or kinks is simple, speedy work with a GREENLEE Hand Bender. Lets you "custom tailor" your pipe, tubing, and conduit installations right on the job. Especially designed to form neat bends for sharp corners, nooks and other close quarters. Various models and sizes. Write for free Bender Book.



GREENLEE TOOL CO., 2384 HERBERT AVE., ROCKFORD, ILL.

When inquiring check CP 5086 opposite last page



Offer:

- **Versatility:** ideal for batch production or where quick-changeovers are desirable.
- **Simplicity:** most economical to maintain and operate.
- **Corrosion-Resistance:** inert to all chemicals and solvents except hydrofluoric acid and hot caustics.
- **Non-absorbent:** body is dense, impermeable.
- **Non-contaminating:** no metallic impurities, the porcelain body is completely iron-free.
- **Easy-Cleaning:** cleans as easily as a china dish.

All "U.S." vacuum filters will withstand a complete vacuum. They are made in several styles and in a size range from one gallon to 150 gallons.

Write for Bulletin F-40

259E

CHEMICAL  
CERAMICS  
DIVISION

**U. S. STONWARE**

AKRON 9, OHIO

When inquiring check CP 5087 opposite last page

## NEW LITERATURE

### Details stoneware for labs

Including specifications for stone laboratory sinks, gutters, drainboards, and pegboards, four-page bulletin also describes characteristics of the stone used. Stone is a natural quarried silicate highly resistant to chemical attack. Two grades of stone are discussed.

"Alberene Stone" is issued by Alberene Stone Corp. of Virginia, Dept. CP, 419 Fourth Ave., New York 16, N.Y. When inquiring specify CP 5088 on form which is located opposite last page.

### Vaporizer capacities and uses treated

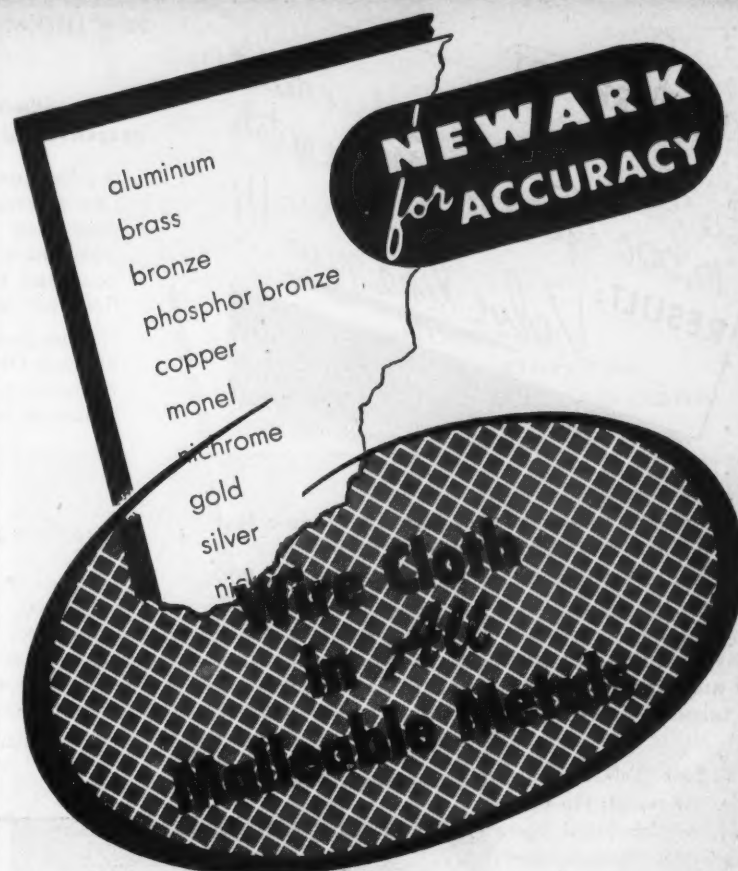
Capacities for various vaporizer models and suggested applications for vaporizer process heating equipment are treated in four-page bulletin. Suitability of equipment for use with Dowtherm A or E, Aroclor #1248, para-cymene, oil, or anisole is discussed.

Bul DV is available from Union Iron Works, Dept. CP, Erie, Pa. When inquiring specify CP 5089 on form which is located opposite last page.

### Heat exchanger tubing discussed in folder

Technical folder of eight pages discusses heat exchanger and condenser tubes of various grades of carbon, alloy, and stainless steels, both seamless and welded. One section deals with problems of installing heat exchanger and condenser tubes by expanding method. Specifications and data on various grades of tubing are included.

Folder TB-329B is available from Babcock & Wilcox Co., Tubular Products Div., Dept. CP, 712 Eleventh St., Beaver Falls, Pa. When inquiring specify CP 5090 opposite last page.



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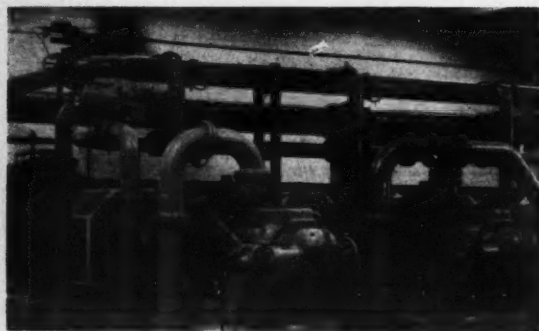
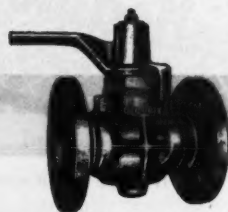
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## NEW LITERATURE

### How to eliminate excessive noise

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"Silence Service for Industry" is issued by Metal Products Div., Koppers Co., Inc., 200 Scott St., Baltimore 3, Md. When inquiring specify CP 5092A on form opposite last page.

### Film reviews phenolic molding

Designed for use in industrial plants and technical schools, 16-mm sound film presents simple step-by-step discussion of techniques involved in producing phenolic molded articles. Film runs 20 minutes and may be borrowed without rental fee. Instructor's manual accompanies film.

Film "Molding Phenolics" is issued by Bakelite Co., Div. of Union Carbide & Carbon Corp., Technical Film Library, Dept. CP, 292 Madison Avenue, New York 17, N. Y.

### Presents X-ray diffraction powder patterns

Presenting 45 standard X-ray diffraction powder patterns, circular also includes review of powder diffraction data previously published. Patterns revise 74 corresponding patterns filed with ASTM. Exceptionally high purity samples were used to secure the patterns together with a Geiger counter X-ray diffractometer. Circular also includes patterns for five compounds not previously represented in the ASTM file.

To obtain "Standard X-ray Diffraction Powder Patterns", Circular 539, Volume V, October 21, 1955, remit 45 cents directly to Government Printing Office, Washington 25, D. C.

### Fatty alcohol survey

Properties, uses, potentials of Cachalot fatty alcohols, monohydric nonionic compounds, are presented in 12-page booklet. Uses, solubilities, and infrared spectra are all shown in graphic form. Eight chemical equations are depicted.

"Survey" is issued on direct letterhead request by M. Michel & Co., Inc., Dept. CP, 90 Broad St., New York 4, N. Y.

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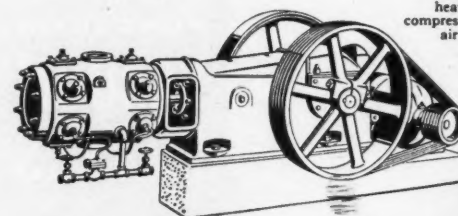
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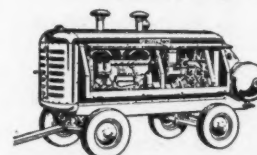
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CHEMICAL PROCESSING





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Discussed in This Issue - - -

## PROCESSES, EQUIPMENT and MATERIALS



Use this "quick-locator" when you want information on a specific type of process, equipment or material mentioned in the processing stories or the advertisements in this magazine. Everything discussed in this issue is given here, if you want more data you can write manufacturer direct . . . or turn to the last page and use the "Information Request Slip." This is a special service provided by the publisher . . . no obligation or charge, of course. The publisher contacts the proper manufacturers for you—information comes to you direct.

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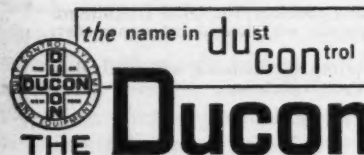
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# HAMMOND IRON WORKS

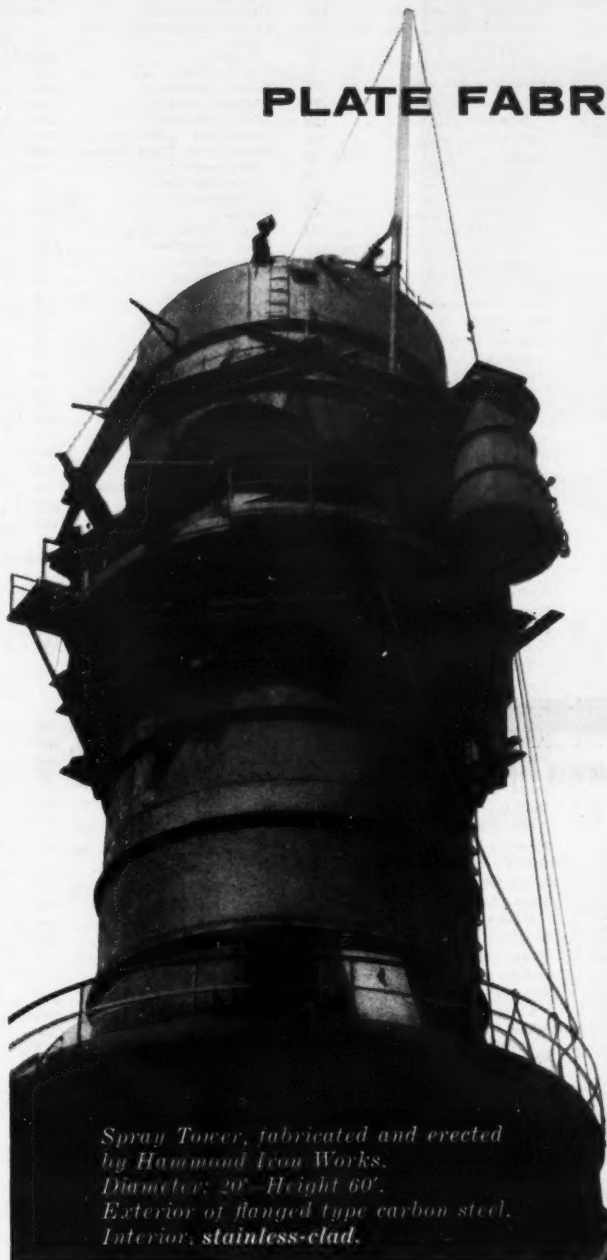
## PLATE FABRICATION

## AND ERECTION

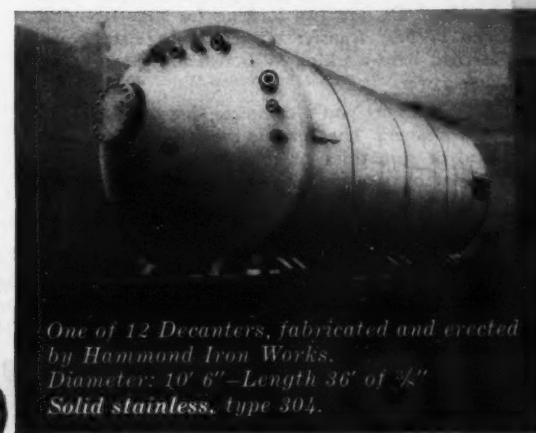
of Vessels, Tanks, Towers, odd and intricately designed chemical equipment...to any size...of any material: steel, aluminum, stainless, stainless-clad, special alloy, etc.

HAMMOND has a background of more than 50 years' successful service to the chemical industry. With its 5 plants and its know-how, based upon experience, no job is too large or too small for Hammond.

Catalog 54B illustrates the Hammond story... write for your copy.



*Spray Tower, fabricated and erected by Hammond Iron Works. Diameter: 20' Height 60'. Exterior of flanged type carbon steel. Interior, stainless-clad.*



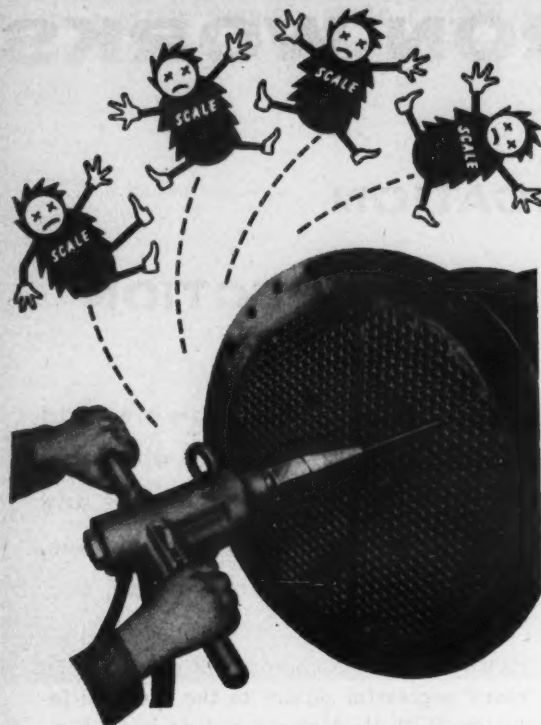
*One of 12 Decanters, fabricated and erected by Hammond Iron Works. Diameter: 10' 6"-Length 36' of 1/2" Solid stainless, type 304.*

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Are your tubes completely fouled with scale buildup? Or, are you looking for that last vital inch of heat transfer efficiency? In either case, efficient hard-working Wilson Tube Cleaners are the answer.

Wilson brings you a complete line of fast-acting tube cleaners. They handle every kind of deposit, hard or soft, thick or thin or variable in depth. Driven by air, steam, water or electricity, these powerful cleaners make quick work of cleaning straight or curved tubes.

For heavy duty service, for example, use Wilson Model TP 301 shown above. This tube cleaner is suitable for vertical or horizontal use in straight or curved tubes  $\frac{3}{8}$ " ID to  $2\frac{1}{4}$ " ID and up to 40' long. Cleans rapidly, thoroughly, operating at high speed at 90 psi. Can run on pressure as low as 50 psi.

Write for your free copy of new Wilson Catalog 77. It's a mine of information on tube cleaning problems.

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TUBE CLEANERS • TUBE EXPANDERS

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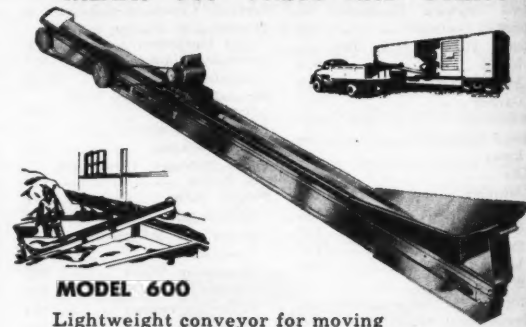
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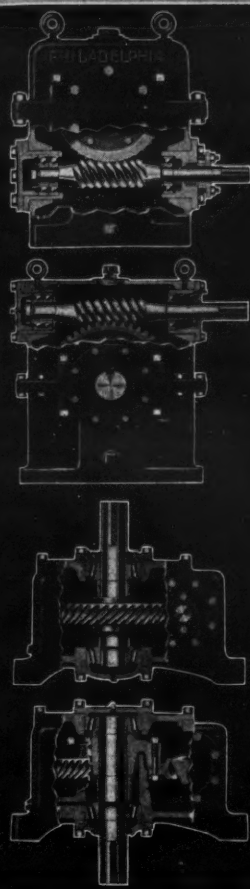
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CHEMICAL PROCESSING



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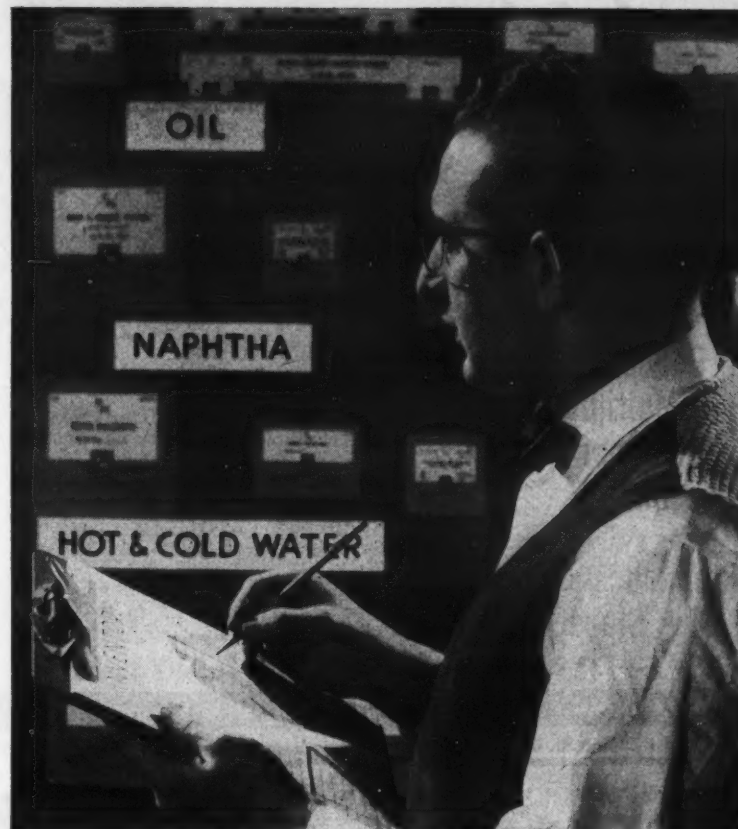
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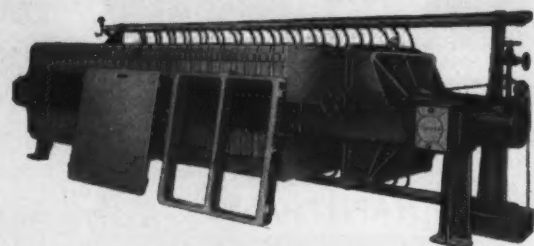
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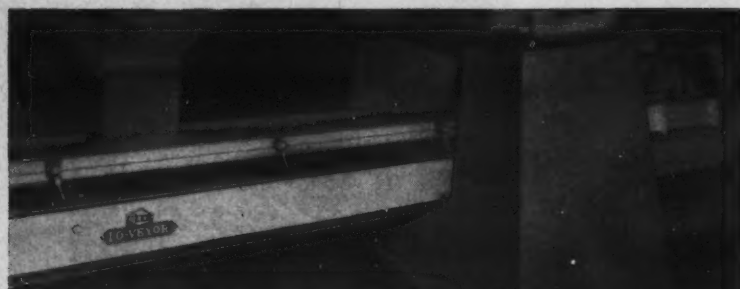


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## THAT'S INTERESTING

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"Patoooo — another plastic one"

### Termite's nightmare

New 36' LCVPs being built for the Navy will be fabricated from reinforced plastic. Formerly boats kept in storage for reserve purposes deteriorated badly. In addition, termites took a toll of several hundreds annually. Reinforced plastic boats are termite resistant, can be stored indefinitely, need no painting, and withstand all weathering conditions.

### Paper industry gets huge generator

International Paper Company, down in Mobile, Ala., will be receiving a big package from General Electric sometime this year — largest steam-turbine generator in the paper industry.

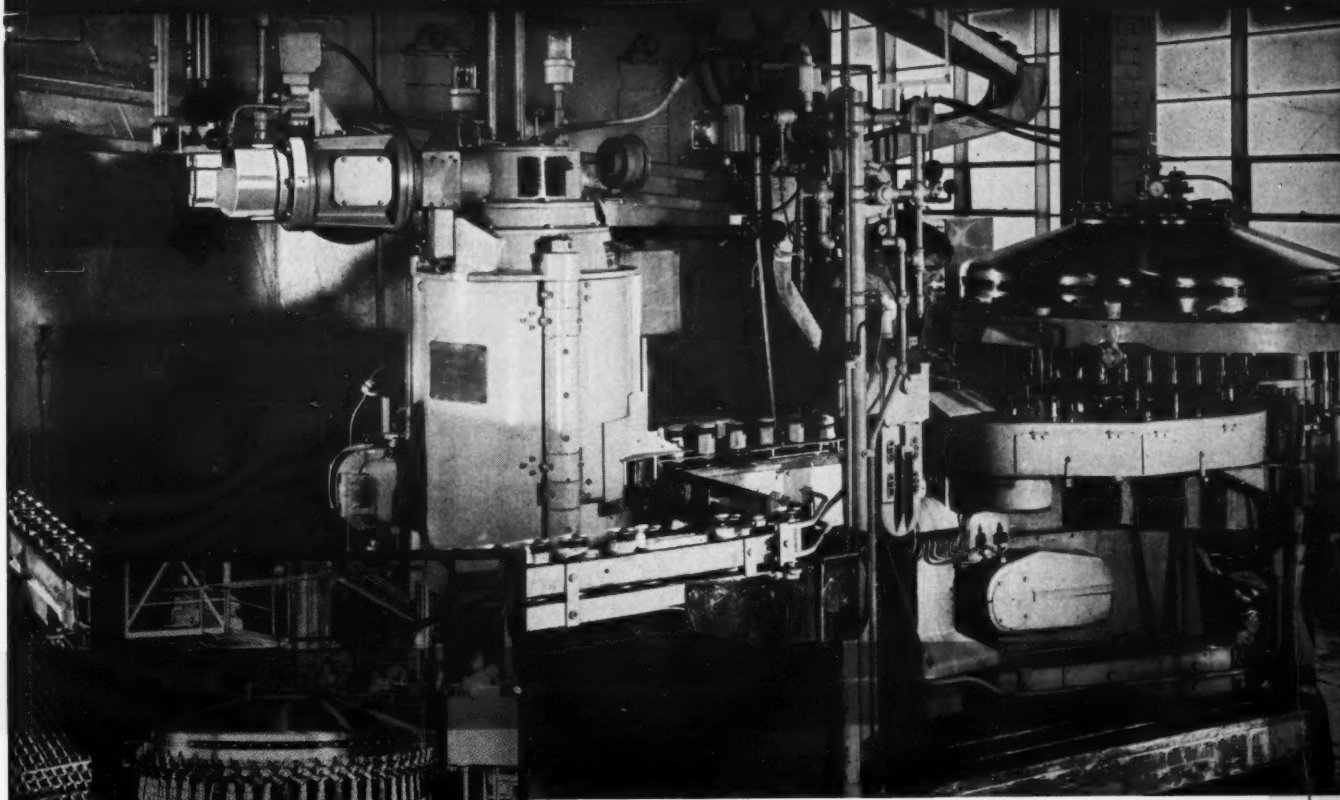
The 40,000-kw single automatic-extraction condensing unit has a turbine which will operate at a throttle pressure of 1450 psi at 1000°F — the highest steam pressure and temperature in paper making.

### Shooting clinkers

A sharp reduction in kiln-cleaning costs is expected with the development of a kiln gun shell with 18% more muzzle energy. Western 8-gage Super-X industrial shell generates muzzle energy in excess of 8900 lb. Because it causes faster breakdown of clinker rings, fewer shots are required.

For more information on product at right, specify CP 5117  
... see information request  
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# You too can discover THE WAY UP IS OILGEAR



Beer Can Filling and Closing Machines equipped with Oilgear "ANY-SPEED" Drives are operating in many breweries. With Oilgear, beer can filling and closing production climbed from 360 to 600 cans a minute.



**PIONEERS...NOW THREE PLANTS  
FOR FLUID POWER**  
PUMPS, MOTORS, TRANSMISSIONS, CYLINDERS & VALVES

## "ANY-SPEED" DRIVES BOOST FILLING-CLOSING RATE TO 600 BEER CANS PER MINUTE. SIMPLIFY MACHINE DESIGN TOO.

There is a necessity upon every machine designer to improve the performance of his machines—if he can. When the designers of beer-can filling and closing machines raised the rate from 150 to 360 cans per minute, the drive limit seemed to be reached. Yet, their users wanted more production *without spillage* or can conveyor problems.

Then these engineers tried Oilgear "ANY-SPEED" Drives... the Fluid Power and Control that gave them what they wanted and—even more.

These engineers stipulated: • accelerate machines to half speed in 2 seconds • accelerate machines to full speed in 5 seconds • decelerate and stop machines in 4/10 seconds • a filling-closing rate of 425 cans per minute.

The Oilgear drive accelerated and decelerated so smoothly, it actually provided: • acceleration to full speed in 2 seconds • deceleration and stop in 2/10 seconds • a filling-closing rate of 600 cans per minute.

That's not all. Oilgear's cushioned application of power plus inherent positive protection against high overload starting torques and lower overload running torques eliminated the need of mechanical slip clutches. Thus, the machine design is simplified and maintenance is negligible.

This smooth yet swift acceleration and deceleration that allows brewers to handle full cans without spilling is one of two tremendously important Oilgear advantages. Utterly variable, flexible and controllable speed is the other. These and other superiorities are writing new history in machine design. *You ought to know the details of that history.* Why don't you contact a nearby Oilgear engineer, or write to Milwaukee. No cost, but the profits may be great.

**THE OILGEAR COMPANY**  
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Milwaukee 4, Wisconsin



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